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Relationship between Affordable Care Act and Emergency Department Visits

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The Relationship Between Affordable Care Act and Emergency Department Visits

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Nova Southeastern University
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Abstract

Affordable Care Act (ACA) was passed and implemented to expand insurance coverage, reduce health care cost, and improve the quality of care. The purpose of this dissertation study was to investigate whether the ACA insurance expansion correlates with the number of visits made to emergency departments (EDs). The quasi-experimental design interrupted time series was utilized in the analysis. The ED visits were compared using MANOVA to determine the relationship between ED visits and ACA and canonical correlation analysis to assess the strength of the relationship and the extent to which independent variables could predict the dependent variable. The hypothesis was that the ACA will reduce the uninsured, increase the insured, and reduce the ED visits. The relationship between number of ED visits and the ACA will present whether the uninsured patients contributed significantly to the ED overcrowding. Analysis of secondary data from four EDs (H1, H2, H3, and H4) in the Chicago area showed that 484,742 visits were made, and 2,801 were excluded due to unknown payer type. Medicaid patients recorded the largest number of visits (181,226) while the uninsured patients recorded the least number of visits (56,572). The ED visits decreased by 6% from 2012 to 2013 (pre-ACA) and increased by 4% from 2013 to 2105 (post-ACA). The ACA implementation increased the people with insurance who visited the EDs by 11%. The results demonstrated a strong relationship between ACA and ED visits. The correlation of the variables (hospital and year) and ED visits demonstrated that the hospital could explain 97% of the Medicaid visits and 87% of uninsured while the year could predict 82.6% of the uninsured visits and 52.5% of Medicaid visits.

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Chapter 1: Introduction

Introduction

The cost of health care and the total number of the uninsured have been rising in the United States (US) for many years, calling for health care reform so as to expand health insurance coverage, control the cost of health care, and improve the quality of health care. The campaign for some form of government-funded health care has been an evolving political project. The passage of the Patient Protection and Affordable Care Act (PPACA) or Affordable Care Act (ACA) in March 2010 fulfilled a goal of many years (Emanuel, 2014; Starr, 2013). The complexity of the ACA in scope and length coupled with its multiple year rollout makes it difficult to assess its success (Antos, 2014; Blumenthal, Abrams, & Nuzum, 2015; Perez, 2013). The success of the ACA will be judged on its cumulative effects on adequacy of access to care, the cost of health care, and the quality of health care Americans received (Blumenthal et al., 2015). The relationships between the ACA insurance expansion and the number of visits made to emergency departments (EDs) was elucidated in a point-of-service study.

The endeavor for some form of comprehensive health care reform in the United States of America had been persistent for many years (Anderson, Dobkins, & Gross, 2014; Emanuel, 2014; Starr, 2013). The U.S. health care system has become more complex, sophisticated, and expensive, which demands comprehensive reform (Anderson et al., 2014; Emanuel, 2014). The number of the uninsured and ED visits has been growing for many years (Kellermann, Hsia, Yeh, & Morganti, 2013). There have been several attempts to reform the U.S. health care system in an effort to expand insurance coverage and decrease medical expenditures (Emanuel, 2014; Pande, Ross-Degnan, Zaslavsky, & Salomon, 2011; Starr, 2013).

The crowded, chaotic ED is often invoked as a symbol of the inadequacies with the U.S. health care system (Fisman, 2014). The uninsured are often accused of cramming into the EDs, seeking routine medical attention, which could be provided more cost effectively through primary care providers. The Institute of Medicine has deemed the EDs as "the safety net of the safety net . . . the provider of last resort for millions of patients . . ." (Tang, Stein, Hsia, Maselli, & Gonzales, 2010, p. 664).

The overutilization of the EDs is not a result of lack of insurance although ED overcrowding has been associated with the uninsured. Many reasons have been cited as causes of ED overcrowding, which include the aging of the population, increased numbers of time-sensitive interventions requiring state-of-the-art hospital care, large number of patients with complex medical conditions, and complications from the complex medical and surgical treatments (Fisman, 2014; Taubman, Allen, Wright, Baicker, & Finkelstein, 2014; Weber et al., 2008).

Research studies that have been conducted in an effort to understand ED overcrowding have yielded mixed results; some researchers have cited lack of insurance as the cause of ED overcrowding while others have cited Medicaid insurance as the reason for increased ED utilization by the new Medicaid enrollees (Baicker et al., 2013; Cheung, Wiler, Lowe, & Ginde, 2012; Fisman, 2014; Smulowitz et al., 2011; Tang et al., 2010; Taubman et al., 2014). Insurance coverage increases access and utilization of health care services (such as EDs), mental health services, and reduction in financial restrain (Baicker et al., 2013; Cheung et al., 2012; Fisman, 2014; Tang et al., 2010). The Massachusetts health reform recorded a small but statistically significant decrease in the rate of low-sensitivity ED visits (Smulowitz et al., 2011). The health insurance expansion increases access to health care by decreasing financial barriers; however,

the newly insured are reported to continue to have difficulties accessing routine care promptly (Cheung et al., 2012; Pande et al., 2011). Some researchers reported increased ED utilization with Medicaid insurance coverage expansion, and others reported decreased ED use while others reported mixed results (Anderson et al., 2012; Baicker et al., 2013; Cheung et al., 2012; Smulowitz et al., 2011; Tang et al., 2010;). Gindi, Cohen, and Kirzinger (2012) reported that (a) 79.7% of adults visited the ED due to lack of access to health care providers, (b) 66.0% visited the ED due to the seriousness of the medical problem or condition, (c) 54.5% utilized the ED because they thought only the hospital could help, (d) 48.0% visited the ED because their doctor's office was not open, and (e) 46.3% went to the ED because there was no other place to go. Gindi et al. (2012) demonstrated that the issue of ED overcrowding is more complex and may not be as result of overuse by people without insurance. The complex and sophisticated ED utilization needs further research studies to correlate the comprehensive insurance coverage expansion under the ACA to the number of ED visits.

Statement of the Problem

The demand for ED services has been increasing since 1996. The number of EDs across the country has been declining while the number of ED visits has been increasing. Millions of individuals access their health care services in EDs each year with a significant increase in the recent years (Carter, Pouch, & Larson, 2014). The EDs across the country have been experiencing higher patient volume and overcrowding as result of increased demand (Garcia, Bernstein, & Bush, 2010). ED overcrowding has been associated with increased mortality and poor quality of care (Carter et al., 2014). The root cause of ED utilization and overcrowding is complex to some observers while others think it is obvious: "It's all those darn patients" (Schull,

2005, p. 14). Health insurance coverage is one of the factors that has a potential to alleviate or exacerbate ED overcrowding, which is often expensive (Anderson et al., 2014).

The number of the people without health insurance coverage and the number of ED visits have been rising over several decades. During the times of ED overcrowding, the demand for emergency services outweighs accessible resources (Carter et al., 2014). From 1999 to 2009, the number of ED visits increased by 32% nationwide (Carter et al., 2014). Weber et al. (2008) showed that the number of ED visits rose by 26% between 1992 and 2005, and Hunt, Weber, Showstack, Colby, and Callaham (2006) indicated a 26% increase in ED visits between 1993 and 2003. This steady rise of the demand for ED services has been blamed for the rise in the cost of health care in the US (Anderson et al., 2014; Fisman, 2014; Rosenbaum, 2010). These changes in the demand for ED services and the rise in cost of health care services have been the driving force behind the proponents of the ACA to call for health care reform to restructure the U.S. health care system so as to curb or solve these challenges. The EDs have been associated with the rising cost in U.S health care system, which has been the driving force behind health care reform (the ACA) to tame the cost of health care, expand coverage and improve the quality of the health care (Cheung et al., 2012; Pande et al., 2011).

After several years of attempt, the ACA was finally passed by the U.S. Congress and signed into law by president Obama in 2010. The ACA's goals are to expand health insurance coverage, control the cost of health care, and improve the quality of care (Blumenthal et al., 2015; Carter et al., 2014; Fisman, 2014). The expansion of health insurance coverage has potential to increase the demand for health care services. Researchers have indicated that insurance enrollment continues to increase since the implementation of ACA in January 2014 (Antos, 2014; Clemons-Cope, Long, Coughlin, Yemane, & Resnick, 2013). The ED is an

important bellwether for access to care, the most common venue for acute care, and the most frequent source of inpatient hospital admissions (Cheung et al., 2012; Rabin et al., 2012). The ED utilizations are important indicators of health care system performance. Many EDs in the US are often overcrowded, often blaming the uninsured patients as the primary cause (Fisman, 2014).

The expansion of health insurance coverage under the ACA had a potential to reduce the number of the uninsured thus increasing the number of people covered by health insurance (Fisman, 2014). The proponents of the ACA express confidence that ACA insurance expansion will reduce the number of ED visits (Blumenthal et al., 2015; Fisman, 2014; Lin, Bharei, Zhang, O'Connell, & Clark, 2015; Richardson & Mountain, 2009). Research studies are needed to evaluate the effects of ACA on the number ED visits. ED crowding is a major patient safety concern associated with poor patient outcomes and increased rates of mortality (Carter et al., 2014). Interventions and policies are needed to address this significant health problem. In order for one to design and implement these seriously needed interventions, studies are needed so as to understand the causes of ED overcrowding.

Purpose of the Study

The purpose of this dissertation study was to investigate whether the ACA health insurance coverage expansion correlated with the number of visits made to H1, H2, H3, and H4 EDs. The relationship between the number of ED visits and the ACA health insurance coverage expansion was explored in this study. The role of the uninsured patients in the ED overcrowding and whether the people with or without health insurance contributed significantly to the rise in the number of ED visits was also investigated.

This dissertation study was designed to review the relationship between the ACA and the number of ED visits. This dissertation study was, therefore, undertaken to examine the number of visits made to the ED of the four hospitals (H1, H2, H3, and H4) from (a) January 1, 2012, to December 31, 2012; (b) January 1, 2013, to December 31, 2013, (prior to the ACA implementations); and (c) January 1, 2015, to December 31, 2015, (after the implementation of the ACA) so as to have a clear picture of the effect of the ACA on the ED utilization. This study was also designed to evaluate the effects of the ACA insurance expansion on the number of ED visits made to the four hospital EDs and to determine the payer source that contributed the most number of visits to the different EDs.

The number of visits made in 2012 and 2013 was compared with those made in 2015 so as to understand the relationship between health insurance coverage expansion under ACA and the number of ED visits. The strength of the relationship between the ACA insurance expansion and the number of ED visits was also explored. The number of visits made to the EDs of H1, H2, H3, and H4 in the Chicago area in 2012, 2013, and 2015 was examined. The four hospitals are located in various neighborhoods with varied economic levels of people in and around the city of Chicago. All the four hospitals are non-profit, thus providing care to all people without regard to their insurance status, which made them appropriate for this dissertation study.

Research Questions and Hypothesis

Research Questions

In the dissertation study, the relationship between the ACA insurance expansion and number of ED visits made to the four hospitals in the Chicago area was examined. The effect of the ACA insurance expansion on the ED overcrowding was explored. The supposition for this study was that ACA insurance enrollment would reduce the number of the uninsured and

increase the number of the insured. The ACA insurance expansion (years) was the independent variables (IV) and the number of ED visits (and their respective payer types) were the dependent variable (DV). The research questions included the following:

1. Did the Affordable Care Act insurance expansion change the number of emergency department visits in Illinois?
2. What is the relationship between the insurance coverage expansion under Affordable Care Act and the number of emergency department visits in Illinois?

Hypothesis

In an effort to answer the above research questions, the following hypotheses were made for this dissertations study

H_1. The ACA insurance expansion will increase the number of people covered by health insurance and decrease the number of people not covered by health insurance.

H_2. The insurance expansion will increase access to health care services, including primary care services, thus reducing the number of people seeking care at the EDs.

H_3. The ACA insurance expansion will reduce the number of ED visits, including those made by the uninsured.

Relevance and Significance of the Research

The ACA complexity in scope and length makes it difficult to assess its success (Antos, 2014; Blumenthal et al., 2015; Perez, 2013). The ACA was enacted with the intent to modernize and improve a large part of the U.S. health care system without a rigid bureaucratic structure rather with a dynamic and flexible structure that could develop and institute policies that respond to real time in order to improve quality and reduce cost while expanding health insurance coverage (Orszag & Emanuel, 2010). A sustainable health care system must be affordable,

acceptable, and adaptable; however, the heated political debate over the ACA and lack of definitive evaluations of the many ACA programs complicates its objective assessment (Fineberg, 2012). The effects of ACA at the point of service, such as EDs, are factors that demand review with research studies (Blumenthal & Collins, 2014; Blumenthal et al., 2015; Sommers et al., 2014).

The ACA implementation provided an opportunity for understanding the causes of ED overcrowding by evaluating the number of ED visits after ACA insurance coverage expansion, comparing them with those visits prior to ACA implementation. An analysis of the relationship between ED utilization and ACA presented an opportunity for understanding the impact of the reduction of the uninsured patients through the insurance coverage expansion under the ACA. Many proponents of health care reform expressed confidence that expansion of insurance coverage under the ACA had potential to reduce ED overutilization (Richardson & Mountain, 2009), thus this dissertation study was used to provide the cumulative effects of the ACA on the number of ED visits.

This dissertation study used the Anderson's model of health care utilization as its theoretical framework (Anderson, 1995). The Anderson model of health care utilization (see Figure 1) presents that health care services utilization are triggered by predisposing factors, enabling factors, and individual specific health care needs (Anderson, 1995; Graves, 2009). The factors that influenced the need of ED services can be classified as (a) those who relate health needs of patients, (b) those who predispose the patients to seek ED services, and (c) those who enable patients to seek ED services (He, Hou, Toloo, Patrick, & Gerald, 2011). The age of the patients, access of EDs, cost of ED health care services, and income of the patients were examined as predisposing factors. Insurance coverage (insured and uninsured), health status

(illness acuity) of the patients, convenience of the ED (accessibility), and physician referral or advice were examined as enabling factors. Individual medical needs and perceived severity of the medical needs were examined as needs. The utilization of the health care system (environment) is guided by the individual patient's personal choices (health behavior). It was surmised that the ACA insurance expansion will increase the number of the insured and reduce number of the uninsured. In order to understand the ED utilization, one must understand how the ACA insurance expansion influenced the demand for ED services.

This dissertation study has information about the insurance status of those patients who were seen in the EDs. It also has an answer as to the insurance status of those who comprise the majority of ED visitors. The dissertation study also has an answer as to whether the uninsured are primary cause of ED overcrowding and, therefore, the cause of the rise of health care cost. The data about the relationship between ED visits and ACA insurance expansion also demonstrated relevant statistics necessary for resolving the ED overcrowding, which has been associated with patient safety issues, poor health outcomes, and poor quality of care, which could be measured by examining the rate of mortality, infections, and length of stay (Carter et al., 2014; Garcia et al., 2010).

Definition of Terms

Terms

Affordable Care Act. The ACA is comprehensive health care reform enacted and signed into law by president Obama in March 2010. It is also known as the Patient Protection and Affordable Care Act or Obamacare. The ACA main objectives were to establish universal health care coverage, eliminate insurance discrimination, restraining health care cost, and improve access to health care (Blumenthal & Collins, 2014; Blumenthal et al., 2015; Emanuel,

2014; Starr, 2013). In an effort to achieve its goals, the ACA mandated that every American must carry health insurance and provide subsidies to consumers so as to reduce the cost of health care. The ACA expanded Medicaid and created health insurance exchanges in an effort to increase health insurance access to all Americans (Emanuel, 2014; Starr, 2013).

Medicaid. Medicaid is an "entitlement program" created by the federal government but administered by the state to provide payment for medical services for low-income citizens (Bodenheimer & Grumbach, 2009). Medicaid requires that one meet certain requirements in order to qualify, which is means testing. *Expanded Medicaid* occurs when the state or federal government lowers the requirements in order to increase the number of people who qualify for Medicaid (Bodenheimer & Grumbach, 2009).

Overcrowding. Overcrowding occurs when the supply of health services is inadequate to meet the demand of those resources. Overcrowding in the ED refers to a situation in which patients in the ED requiring inpatient care are unable to gain access to appropriate hospital beds within a reasonable timeframe.

Emergency department. The ED is a medical treatment facility, specializing in acute care of patients who present without prior appointment either by their own means or by ambulance. The emergency department is usually found in a hospital or other primary care center.

Uninsured. The uninsured are those people or groups of people who are not covered by a health insurance plan (Bodenheimer & Grumbach, 2009). These are people or group of people who are not likely to pay for their medical care or health care through an insurance company (Bodenheimer & Grumbach, 2009).

Insured. The insured are those people or groups of people who are covered by private medical insurance or health insurance plan (Bodenheimer & Grumbach, 2009). These people or groups of people are likely to pay for their medical or health care through a private insurance company (Bodenheimer & Grumbach, 2009).

Summary

The overcrowding of EDs is a U.S. health crisis that needs considerable attention in order to be solved. Research studies need to be conducted to determine the primary causes. State and federal policymakers have often blamed the uninsured for the ED overcrowding, thus proposing health care reform primarily to increase the number of the insured. The passage and implementation of ACA to expand insurance coverage so as to reduce the number of the uninsured and thus reduce the cost of health care in the long run. Researchers have indicated mixed results, some supporting lack of insurance as the cause of ED overcrowding while others have not found any significant statistical relationship between the uninsured and ED utilization (Baicker et al., 2013; Cheung et al., 2012; Fisman, 2014; Smulowitz et al., 2011; Tang et al., 2010; Taubman et al., 2014).

For a long time, the uninsured patients have been blamed for ED overcrowding. Understanding the relationship between ED visits and insurance expansion presents needed information in setting up policies and interventions in an effort to solve ED overcrowding, patient safety issues associated with patient negative outcomes, improve quality of care, and provide medical professional with needed relevant data for decision making.

This dissertation study was undertaken in an effort to correlate the ACA insurance coverage expansion and the number of ED visits to the four hospitals. This dissertation study presented information about the insurance status of those patients who were seen in the EDs. It

presented an answer as to the insurance status of those who comprise the majority of ED visitors. This dissertation study also presented an answer as to whether the uninsured are primary cause of ED overcrowding, thus the cause of the rise of health care cost. The data about the relationship between ED visits and ACA insurance expansion also presented relevant statistics necessary for resolving the ED overcrowding, which has been associated with patient safety issues, poor health outcomes, and poor quality of care.

Chapter 2: Literature Review

Introduction

This literature review chapter presents an introduction to the U.S. health care system, the historical background of health care reform in the US, theoretical framework upon which this dissertation study is based on, and existing research studies that lays a foundation for this study.

U.S. Health Care System

The ED was created to provide communities with lifesaving care, 24 hours a day, serving as community hubs for disaster response, and diagnostic centers to evaluate and treat urgent conditions (Kellermann et al., 2013). The need for 24-hour medical care and rapidly growing population of patients seeking immediate and unscheduled medical care for emergency conditions has promoted the growth of the EDs (American Academy of Emergency Medicine [AAEM], 2014; Kellermann et al., 2013). The ED utilization has continued to grow in the recent years, leading to overcrowding in many EDs (Hunt et al., 2006). Lack of insurance has often been blamed for ED overcrowding (Taubman et al., 2014). This ED overutilization has been attributed to the rising cost of health care, increased rates of mortality, and poor quality of care in the US (Fisman, 2014; Taubman et al., 2014; Weber et al., 2008).

The U.S. health system was not created as it appears today. It has evolved to become complex and expensive over several years (Emanuel, 2014). The number of the uninsured has been increasing to approximately 46.3 million (Connors & Gostin, 2010; Smith & Medalia, 2015; Tang et al., 2010). The problem of ED overcrowding and rising cost of health care has continued to persist despite being recognized as major problem to the quality of health care. Comprehensive health care reform (Affordable Care Act of 2010) was passed and implemented after several attempts to reform the U.S. health care system in an effort to tame the consistent

rise of the cost of health care and improve the quality of health care (Antos, 2014; Blumenthal et al., 2015; Perez, 2013).

Historical Background

U.S. health care system has evolved from the health of the general public to a growing and increasingly pressing awareness of the unmet health care needs of individuals (Chapman & Talmadge, 1970; Emanuel, 2014; Palmer, 1999; Starr, 2013). Health insurance has been a dream and perennial disappointment for many Americans, often on the horizon beyond reach (Smith & Medalia, 2015; Starr, 2013; Tang et al., 2010). While there have been historical continuities from one era to another, objectives of reform often shifted, and the economics of health care changed (Emanuel, 2014; Starr, 2013).

History of Health Care Reform

United front on behalf of health insurance. Early in the 20th century, industrial America was faced with the problem of sickness as many working people started missing work due to illnesses thus loss of wages (Emanuel, 2014; Hoffman, 2003). The loss of wages raised the issue of health reform to the forefront during the great depression (Hoffman, 2003). In 1912, Teddy Roosevelt proposed that state laws be enacted to provide coverage for hospital and medical expenses, maternity care, and labor and delivery, replacement income, funeral expenses, and maternity leave (Emanuel, 2014; Starr 2013). The American Association of Labor Legislation (AALL) drafted a model bill in 1915 through its social welfare committee, which limited health insurance coverage to working class and others who earned less than $1,200 a year, which the American Medical Association (AMA) supported, forming a united front on behalf of health insurance (Emanuel, 2014; Palmer, 1999; Starr, 2013).

Movement against health insurance. In 1934, President Franklin Roosevelt (FDR) appointed a committee on Economic Security, chaired by his Labor Secretary to examine the status of health care and make recommendations for the president to introduce. The committee recommended compulsory health insurance, but the AMA opposed compulsory health insurance, and health care reform was dropped from the bill, thus the Social Security Act was passed in 1935, once again delaying health care insurance reform (Emanuel, 2014; Hoffman, 2003; Palmer, 1999).

Anti-government-based insurance system. The American Federation of Labor (AFL) opposed the AALL proposal of a government-based health insurance system, denouncing it as unnecessary paternalistic reform that would create a system of state supervision over people's health. The AFL's opposition was based on its concern that a government-based insurance system had a potential of weakening the union strength (Palmer, 1999). The commercial insurance industry opposed the reformers' efforts because health insurance covered death benefits, leading to a great fear among the working-class families (Emanuel, 2014; Starr, 2013).

Anti-socialistic movement. The AMA and AALL adopted the issue of universal health insurance until the start of World War I (WWI). After the US entered WWI, the government commissioned articles denouncing German socialist insurance, and health insurance opponents capitalized on it, calling it a Prussian menace inconsistent with American values. The entry of the US into WWI tainted anything German, and thus, universal health coverage, being considered a German idea, died with it (Emanuel, 2014; Palmer, 1999).

Medical care for everyone. The concern over cost and distribution of medical care led to the formation of the Committee on the Cost of Medical Care (CCMC) in 1926 and determined that there was need for more medical care for everyone (Emanuel, 2014). The CCMC's research

findings were published in 26 research volumes over a five-year period. Although the AMA treated its reports as radical documents advocating socialized medicine, in 1932, the CCMC recommended that more resources be devoted to voluntary medical care as a means of covering health care cost (Emanuel, 2014; Hoffman, 2003; Palmer, 1999).

Wagner-Murray-Dingell bill. In 1943, Senators Wagner and Murray and Congressman Dingell introduced a bill for comprehensive health insurance into the Social Security system in an effort to establish a medical care and hospitalization fund to cover physician care and 30 days of hospitalization. The fund was to be financed by 1.5% payroll tax on the first $3,000 of income on both employers and employees. The bill was supported by many organizations but was opposed by AMA; it was never brought to the floor for a vote, thus delaying the health care reform (Emanuel, 2014; Hoffman, 2003; Palmer, 1999; Starr, 2013).

Politics. In 1945, California Governor Earl Warren called for comprehensive, compulsory health insurance after consulting with the California Medical Association (CMA). The CMA opposed Governor Warren's compulsory health insurance with a slogan of political medicine being bad medicine, thus the bill was defeated by one vote in the California legislature. The bill was re-introduced in 1946 in the California legislature, only to be defeated again (Emanuel, 2014; Palmer 1999, Starr, 2013).

After President Truman took office, following the death of FDR, the Wagner-Murray-Dingell bill was re-introduced with some modification calling it National Health Insurance, which was integrated with the Fair Deal program. The Ways and Means Committee refused to hold hearings, calling it socialistic (Emanuel, 2014). With his commitment to a single universal health insurance, President Truman lost the democratic majority in Congress in the 1946

election, curtailing all his legislative agenda, thus delaying the health care reform (Emanuel, 2014; Palmer, 1999; Starr, 2013).

Congressmen Richard Nixon and Jacob Javits co-sponsored a voluntary National Health Care Act of 1950. The goal of this act was to enable voluntary pre-payment health insurance plans, using federal money to partially support state programs to make them available to the communities based on subscribers' income. The bill was spun in Congress, thus delaying health reform once again (Emanuel, 2014, Starr, 2013).

Medicare and Medicaid 1950 to 1965. The US took critical steps in the formation of health care financing by focusing on the employer-based insurance and the formation of federal programs for the elderly and the poor (Starr, 2013). By the mid-1950s, the cost of health care and the apparent exclusion of certain groups of people from the employer-based insurance pushed the health care reform back onto the national stage. Congressman Forand sponsored a Medicare bill in 1957 to cover hospital costs through payroll tax. The American Hospital Association (AHA) endorsed it. In 1960, the bill failed to pass in Congress after Forand forced a vote on it, thus delaying health care reform until later that year when the Kerry-Mills Eldercare bill passed unanimously. Although the Kerry-Mills eldercare bill passed unanimously, it never removed the issue of universal health insurance from the national stage, thus persisting into the 1960 presidential campaigns (Emanuel, 2014; Palmer, 1999; Starr, 2013).

In 1961, Congressman King modified the Medicare bill to cover hospital services, skilled nursing home services, and outpatient hospital diagnostic services for Social Security beneficiaries 65 years and older (Emanuel, 2014). This bill continued to face opposition from the AMA; however, Presidents Kennedy and Johnson continued to press Congress for the passage of Medicare (Emanuel, 2014; Starr 2013). In September 1964, Congress offered

Medicare as an amendment on the floor and passed, but differences could not be resolved in conference, thus another failure to achieve health reform (Emanuel, 2014; Palmer, 1999; Starr, 2013).

On January 4, 1964, Congressman King's modified Medicare bill was reintroduced into both houses of Congress. Representative Mills merged all the proposals into the Social Security Amendments of 1965 (known as Medicare and Medicaid), which passed both houses of Congress in March of 1965, and despite strong opposition from the medical community, it was signed it into law in July 1965 (Emanuel, 2014; Palmer, 1999; Starr, 2013).

Comprehensive health care reform. Although a significant achievement in the struggle for health care reform in the US, the enactment of Medicare and Medicaid did not slow down the call for comprehensive health care reform. In 1969, the National Governor's Conference endorsed the need for national health insurance. In 1970, the Senate Finance Committee endorsed a national catastrophic health insurance. Senator Ribicoff and Governor Rockefeller introduced the Medicare-for-all plan while Senator Edward Kennedy proposed the Health Security Act (Emanuel, 2014; Starr, 2013). The struggle for a comprehensive health care reform continued. Several times over the years, it seemed like a comprehensive health reform would be accomplished only to fail in committee or on the floor of Congress.

Wofford's right to doctor epiphany. After decades of inactivity, universal health insurance reemerged to the stage in 1991, during a special election for the U.S. Senate in Pennsylvania when Harris Wofford called for making health care a right (Emanuel, 2014; Starr, 2013). At the time, the private health insurance premiums were steadily rising, and many employers were cutting health insurance benefits, shifting large shares of premiums to employees (Emanuel, 2014; Starr, 2013).

Clinton's health care reform effort. The health care policy experts of the 1990s believed that people should choose among a variety of health insurance options in a structured competitive marketplace for insurers that are likely to drive down the health insurance prices (Emanuel, 2014). When Clinton was elected, he established a Task Force on National Health Care Reform to develop a comprehensive health care reform proposal (Emanuel, 2014; Starr, 2013). The proposal for health reform was delayed by other policy agendas. Finally, after 11 months, the 1,342-page Health Security Act bill was submitted to Congress. The public opinion strongly supported the health care reform and universal coverage but hit a big roadblock when the Congressional Budget Office (CBO) ruled that there would be no cost savings from competition among insurance companies (Emanuel, 2014; Starr 2013).

Affordable Care Act of 2010. By late 2006, the economic and political situation in the US led to the rise of health care cost and insurance premiums renewing the sense of urgency about health care reform to deal with cost and health insurance coverage (Blumenthal & Collins, 2014; Blumenthal et al., 2015; Starr, 2013). The decline in the economic situation of the US and cost of health care brought the health care reform back onto the political stage during the 2008 presidential campaign. In March 23, 2010, the U.S. Congress passed a comprehensive health care reform that included universal coverage as well as many other ways of improving the health care system (Blumenthal & Collins, 2014; Blumenthal et al., 2015; Emanuel, 2014; Starr, 2013).

Although the political cost of health care reform on the proponents was clear, it did not yield the political benefit as originally expected; however, failure could have left the proponents in worse shape (Starr, 2013). The main goals of health care reform were to expand health insurance coverage, restrain the growth in medical expenditures, prohibit insurance

discrimination, and improve access to health care (Anderson et al., 2014; Blumenthal & Collins, 2014; Blumenthal et al., 2015; Emanuel, 2014; Starr, 2013).

U.S. health care delivery systems were never created complex and incredibly expensive from its origin. It has evolved over a long time; many decisions often made for reasons having nothing to do with improving health care shaped our health system (Emanuel, 2014; Starr, 2013). The ACA was enacted based on the Anderson's model of health care utilization in an effort to reform the U.S. health care system in order to make health care accessible and available to all Americans while providing protection against the risks of being bankrupted by medical cost (Emanuel, 2014; Starr, 2013).

Theoretical Framework

The EDs in the US have been overutilized for several decades (Garcia et al., 2010). The overutilization has been associated with the uninsured; however, many reasons have been cited as causes of overcrowding, such as the aging of the population, increased numbers of time-sensitive interventions requiring state-of-the-art hospital care, large number of patients with complex medical conditions, and complications from the complex medical and surgical treatments (Fisman, 2014; Taubman et al., 2014). This dissertation study used Anderson's model of health care utilization (see Figure 1) as its theoretical framework in an effort to understand the effects of insurance expansion under ACA on the ED overcrowding.

The theory of the Anderson model of health care utilization is that health care services utilization is triggered by predisposing factors, enabling factors, and individual specific health care needs (Anderson, 1995; Graves, 2009). The factors that influence the need of ED services can be classified as (a) those who relate to the health needs of patients, (b) those who predispose the patients to seek ED services, and (c) those who enable patients to seek ED services (He et al.,

2011). The age of the patients, accessibility of EDs, cost of ED health care services, and income of the patients were examined as predisposing factors (see Figure 2). Insurance coverage (insured and uninsured), health status of the patients, convenience of the ED, and physician referral or advice were examined as enabling factors (see Figure 2). Individual medical needs and perceived severity of the medical needs were examined as health care needs of the patients. The utilization of the health care system (environment) is guided by the individual patient's personal choices (health behavior; see Figure 1). It is surmised that the ACA's insurance expansion will increase the number of the insured and reduce number of the uninsured. In order to understand the ED utilization, one must understand how the ACA's insurance expansion influences the demand for ED services.

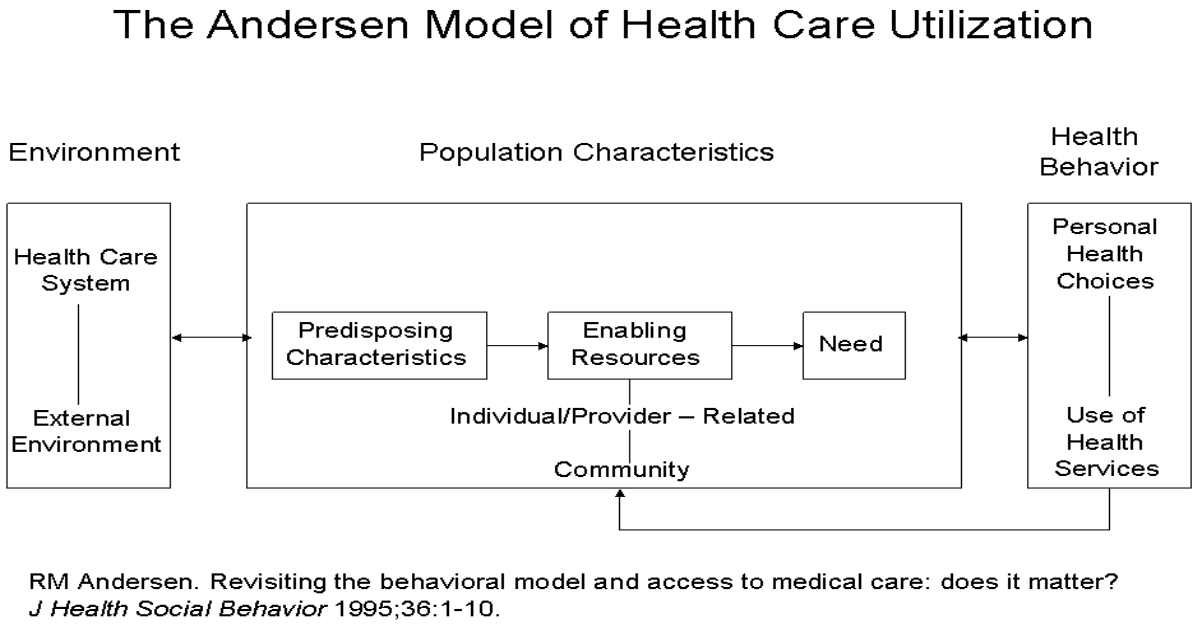

Figure 1. Anderson model of health care utilization. Adapted from "Revisiting the Behavioral Model of Access to Medical Care: Does it matter?" By R. M. Anderson, 1995, *Journal of Health Care and Social Behavior, 36*, 1. Copyright 1995 by The American Sociological Association.

ED congestion is a common problem worldwide. Overcrowding of the ED is often characterized by prolonged waiting time, delays to diagnosis and treatment, and delays in in

treating seriously ill patients often leading to degradation of quality of care, increased costs, and patient dissatisfaction (Erenler et al., 2014). Despite widespread recognition of the problem, research and policy agendas are needed to understand and address it satisfactorily. ED crowding has become a major barrier to receiving timely emergency care in EDs in the United States (Asplin et al., 2003; Fisman, 2014; Taubman et al., 2014). The lack of consensus on the definition of ED crowding has been a challenge for researchers, clinicians, administrators, and policymakers (Asplin et al., 2003).

In the emergency medicine literature, ED overcrowding is defined as having more patients than treatment rooms or more patients than staff should ideally care for (Erenler et al., 2014). Several studies have been undertaken in an effort to understand the causes of ED overcrowding, which have yielded mixed results, making it complex to solve it. Many attempts have been made to eliminate ED overcrowding, but the problem persists (Cunningham, 2006; Hoot & Aronsky, 2008; Taubman et al., 2014; Weber et al., 2008). The aging of the population, increased numbers of time-sensitive interventions requiring state-of-the-art hospital care, large number of patients with complex medical conditions, complications from the complex medical and surgical treatments, lack of insurance, and Medicaid coverage are often cited as the causes of ED overcrowding (Blumenthal et al., 2015; Fisman, 2014; Sommers et al., 2015 Taubman et al., 2014; Weber et al., 2008). The ACA universal insurance coverage presents an opportunity to understand the role lack of insurance plays in ED overcrowding. This dissertation study is, therefore, undertaken to understand effects of insurance expansion under ACA on the number of ED visits.

Existing Research on Health Care Reform

Affordable Care Act and the Uninsured

The ACA was enacted in 2010 with a goal of expanding health insurance coverage and reforming the health care delivery system (Anderson et al., 2014; Blumenthal et al., 2015). The low- and middle-income people have been going without health insurance, making the largest proportion of the uninsured (Smith & Medalia, 2015). It is estimated that the number of people without health insurance had risen to 46.3 million (Smith & Medalia, 2015; Tang et al., 2010).

Potentially preventable high-cost encounters with the health care system often occur in the EDs (Johnson et al., 2012). The uninsured are often accused of crowding into EDs for routine or ambulatory medical care that could be provided more cost-effectively by primary care providers (Billings & Raven, 2013; Cheung et al., 2012; Fisman, 2013; Johnson et al., 2012). The number of people who have been seeking care in EDs and acute care facilities has been rising to the breaking point (Pallin, Allen, Espinola, Carmago, & Bohan, 2013; Rabin et al., 2012). Lack of health insurance has been blamed for forcing many uninsured Americans to seek "free" health care in the emergency department (Fisman, 2014).

The expansion of health insurance coverage through the ACA is expected to reduce the financial burden on insurance carriers although some barriers, including lack of primary care physicians, clinics, and transportations, continue to limit access to timely care (Cheung et al., 2012; Clemons-Cope et al., 2013). It is estimated that the public spends approximately $56 billion or 18% of the total cost of ED revenue in uncompensated care for the uninsured (Hadley, Holahan, Coughlin, & Miller, 2008; Wilson & Cutler, 2014). With its mandate for all Americans to carry health insurance, the implementation of the ACA was meant to achieve universal coverage, thus decreasing the uncompensated health care (Blumenthal et al., 2015; Sommers et al., 2015).

The ACA is designed to expand insurance coverage, control cost, and target prevention. Insurers cannot deny coverage due to pre-existing conditions and must allow children to stay on their parents' health care policy until they turn age 26. It has been estimated that the number of uninsured who have gained insurance coverage since 2010 when young adults became eligible to remain on their parents plans until age 26 ranges from seven million to 16.4 million because of the variations in timings and methods of surveys (Blumenthal et al., 2015; Sommers et al., 2014). The ACA has subsidized premiums for low-income earners and has incentives for businesses to provide insurance coverage for their employees (Blumenthal & Collins, 2014; Connors & Gostin, 2010). Under the ACA, Americans who do not qualify for subsidies and did not obtain insurance for at least 3 months in a year are assessed a penalty of $95 or 1% of their income over the tax-filing limit when they file their tax returns (Blumenthal & Collins, 2014; Fineberg, 2012).

Affordable Care Act and Emergency Departments

The intricacy of the ACA in scope and length combined with its multiple year rollout makes it challenging to assess its success (Antos, 2014; Blumenthal et al., 2015; Perez, 2013). The accomplishment of the ACA will be judged on its cumulative effects on adequacy of access to care, the cost of health care, and the quality of care Americans received (Blumenthal et al., 2015). The opponents of the ACA have argued that the ACA did not reform the health care delivery system, but a thorough examination has found that the health care reform through the ACA constituted the most aggressive efforts to address the delivery system (Blumenthal et al., 2015; Sommers et al., 2014). The ACA changed the organization of the health care delivery systems through the creation of accountable care organizations (ACO) and primary care transformations in an effort to reduce emergency department visits and hospital re-admissions (Blumenthal et al., 2015). The programs emphasize care coordination, chronic disease

management, greater access to primary care, and administrative simplifications in an effort to control cost and improve quality of care (Blumenthal & Collins, 2014; Blumenthal et al., 2015; Perez, 2013).

The heated political debate over the ACA and lack of definitive evaluations of the many ACA programs complicates the objective assessment of ACA necessitating research studies to review the successes of the ACA at the point of service, such as EDs (Blumenthal & Collins, 2014; Blumenthal et al., 2015; Sommers et al., 2014). The ACA has thus brought considerable improvement in access to affordable health insurance, and patients have access to physicians within a reasonable period of time (Blumenthal et al., 2015; Sommers et al., 2014). The implementation of ACA has also coincided with decrease in health care expenditure per capita growth from 5.6% to 3.2% from 2010 to 2013 (Blumenthal et al., 2015). The ACA implementation seems to have decreased hospital-acquired conditions and Medicare re-admissions (Blumenthal et al., 2015).

Emergency Departments and Urgent Care Centers

Because of the struggles of the U.S health care system with ED overcrowding, urgent care centers have emerged as alternative health care settings that have a potential to improve health care access and contain costs (Yee, Lechner, & Boukus, 2013). Urgent care centers have been operating in the US since 1980, growing to approximately 9,000 locations in recent years (Tsai, Liang, & Pearson, 2010; Yee et al., 2013). Urgent care centers have easy access to health care in hours when primary care physicians are not available. Patients could just walk into urgent care centers with illnesses or injuries that need immediate attention, filling in the health access gap during evening and weekend hours for patients without health insurance or those unable to schedule a timely primary care physician appointment (Tsai et al., 2010; Yee et al., 2013).

The EDs are the only places in the U.S. health care system in which individuals can have access to a full range of services at any time regardless of their ability to pay or the severity of their conditions. A large number of ED visits fall into categories of avoidable use, resulting from patients seeking non-urgent care or ED care for conditions that could be treated and/or prevented by prior primary care and/or urgent care centers. The use of ED for non-emergency care leads to crowding, long waits, and added stress to ED staff, taking away their attention from patients needing true emergency care (New England Health Care Institute, 2010; Tsai et al., 2010).

Americans seek a large amount of non-emergency care at EDs due to long wait times for appointments, limited after-hours care at physician offices, and other barriers to access (Tsai et al., 2010; Weinick, Burns, & Mehrotra, 2010). Urgent care centers have emerged as alternatives to the EDs for non-emergency care. The urgent care centers have walk-in care in which the focus is on acute conditions and exacerbations of chronic conditions (Tsai et al., 2010; Weinick et al., 2010; Yee et al., 2013). Weinick et al. evaluated the number of visits to EDs that could be managed at other centers. Weinick et al. (2010) concluded that 35% of the visits to the EDs were for conditions that could have been managed at retail clinics or urgent care centers.

The trend of patients visiting EDs for non-urgent care continues. Tsai et al. (2010) found that more than half of all the ED visits were considered to be non-urgent. Many of the patients visit the ED due its convenience and personal preferences (Tsai et al., 2010). In order for urgent care centers to have a role, there must be a concerted effort both locally and federally. Urgent care centers are accustomed to managing unscheduled, walk-in populations, and they have a potential to reduce ED visits for non-emergency care.

Insurance Expansion and Emergency Departments

In an effort to evaluate the progress the ACA has made in the health care industry, some studies have been conducted to evaluate the progress that has been made since its passage and implementation (Clemons-Cope et al., 2013; Decker, Kostova, Kenney, & Long, 2013; Lin, Bharei, Zhang, O'Connell, & Clark, 2015). The expansion of insurance coverage has a potential to increase health care access. Clemons-Cope et al. (2013) evaluated pooled data from the Medical Expenditure Panel Survey to estimate the potential effects of Medicaid expansion. With Medicaid expansion, there was a significant improvement in health care access, use, and expenditure by the vulnerable non-elderly uninsured adults with chronic health and mental health conditions as compared with their uninsured non-Medicaid covered counterparts (Clemons-Cope et al., 2013).

Lin et al. (2015) examined factors associated with frequent hospitalizations and ED visits among Medicaid members who were homeless and found that approximately one third of the study population had at least one hospitalization, and the other two thirds had one or more visits. They further demonstrated that 12% and 21% of the members incurred 70% of the hospitalizations and ED visits, respectively. The homeless individuals with co-occurring mental illness and substance use disorders were at the greatest risk of frequent hospitalizations and ED visits (Lin et al., 2015). Despite insurance coverage through Medicaid, the homeless had frequent hospitalizations, ED visits, and other ambulatory care office visits (Lin et al., 2015).

As the implementation of ACA continued to expand health insurance coverage through Medicaid expansion and insurance exchanges thus reducing the number of uninsured, Decker et al. (2013) documented health care needs and health risks of the uninsured adults who could benefit from Medicaid expansion under ACA. National Health and Nutrition Examination data between 2007 and 2010 was used to analyze health conditions of the uninsured adults. A sample

of 1,042 uninsured adults aged 19 to 64 years with income no more that 138% of the federal poverty level (FPL) was compared with 471 low-income adults enrolled in Medicaid. The uninsured were less likely to be obese and sedentary and were less likely to report physical, mental, or emotional limitations (Decker et al., 2013). The potentially Medicaid eligible low-income uninsured adults had a low prevalence of chronic conditions as compared with those already enrolled in Medicaid. Those uninsured adults with chronic conditions (such as diabetes, hypertension, and hypercholesterolemia) were unaware of their chronic conditions and had poor disease management (Decker et al., 2013).

The State of Oregon expanded its Medicaid coverage in 2008 for the uninsured through a lottery system by drawing names from a waiting list. Taubman et al. (2014) evaluated the ED use of approximately 25,000 lottery participants to the Portland Area hospital EDs for a period of 18 months. Taubman et al. (2014) examined the effects Medicaid expansion on the ED visits by comparing the treatment group (those selected by lottery for Medicaid) and the control group (those not selected for Medicaid). They found an increased number of visits by the newly insured by Medicaid (Taubman et al., 2014). The expansion of Medicaid coverage significantly increased ED use by 0.41 visits per person or 40% relative to an average of 1.02 visits per person in the control group. There was an overall increase across a broad range of types of visits, conditions, and subgroups, including increases in visits that could be readily treated in primary or ambulatory care settings (Taubman et al., 2014).

The association between ED overcrowding and Medicaid expansion question was not resolved by Taubman et al.'s (2014) study findings. The State of Massachusetts enacted a health care reform of 2006 through the expansion of Medicaid. Unlike the State of Oregon's health care reform, the Massachusetts health reform continued to experience low numbers of the uninsured

and a declining number of ED visits as well as an improvement of inpatient hospital stays self-report health status (Long, Stockley, & Dahlem, 2012). Long et al. (2012) examined the number of visits made to EDs by those with insurance (Medicaid) and those without insurance (uninsured), and they found that the insured made fewer number of visits to EDs in Massachusetts, unlike the health care reform in the state of Oregon.

In a systematic review, Carter et al. (2014) assessed the relationship between ED overcrowding and patient outcomes. A total of 196 abstracts were screened with 12 of them meeting criteria for inclusion (Carter et al., 2014). In three of the 11 studies, there was a significant correlation between ED overcrowding and mortality among patients either admitted to the hospital or discharged home. In five of the studies, there was ED overcrowding with a high rate of patients leaving without being seen. ED overcrowding is a major safety concern that is associated with poor patient outcomes (Carter et al., 2014).

In another systematic review, Uscher-Pines, Pines, Kellermann, Gillen, and Mehrotra (2013) sought to understand the factors that influence an individual's decision to seek care at ED for a non-urgent condition, and 26 articles that met the criteria for inclusion were reviewed (Uscher-Pines et al., 2013). They found that no two articles used the same definition of non-urgent visits. The studies reviewed had a limited understanding of the factors that influence an individual to seek care at the EDs for non-urgent visits and demonstrated limited evidence that younger age, ED convenience, referral by a physician, and negative perception of the alternatives influenced a patients' decision to seek care at EDs (Uscher-Pines et al., 2013).

Affordable Care Act. Proponents of ACA insurance expansion expressed confidence that people with insurance would prefer their primary care physicians for their health care needs instead of EDs once they had health insurance coverage. Nikpay, Freedman, Levy, and

Buchmueller (2017) studied the longitudinal, state data from the Agency for Healthcare Research and Quality's Fast Stats program; however, they showed that Medicaid expansion under ACA increased use of EDs Nikpay et al. (2017) implemented a difference-in-difference analysis comparing changes in ED visits per capital and the share of visits per payer source in 14 states that expanded Medicaid and 11 states that did not implement Medicaid expansion in 2014. The results showed that there were 2.5 visits more in 1,000 total ED visits in states with Medicaid expansion that those states without Medicaid expansion (Nikpay et al., 2017). They also indicated that there was an 8.8% increase of the ED visits by those people with Medicaid while those visits by the uninsured decreased by 5.3% (Nikpay et al., 2017).

Some of these studies, mentioned above, present mixed outcomes while others present indications that are encouraging and promising on the ACA implementation; however, further studies are needed to verify and evaluate success of ACA implementation in the areas of access to care, expansion of insurance coverage, and restraining or controlling of the health care cost. Studies at the point of service (EDs) will be used to evaluate the success of ACA. Expansion of the insurance coverage is expected to reduce the number of the uninsured. Analysis of the number of visits in relation to payer source will be used to provide a clear understanding of effects of the ACA on the number of ED visits.

Chapter 3: Methodology

Introduction

This chapter presents methodology for the participants or subjects of the study, research study design, institutional review board (IRB) application and approval process, and reliability and validity of the study. This section also includes data collection, data preparation, and data analysis. This methodology was used in an effort to examine the relationship between the insurance expansion under ACA (independent variable) and ED utilization or ED visits (dependent variable). This methodology was also utilized to examine the payer type that contributed the largest number of visits to EDs.

Participants of the Study

Secondary data of patients' visits made to the EDs of H1, H2, H3, and H4 in the Chicago area in Illinois were used in this dissertation study. Any visits made to the EDs between January 1st and December 31st of 2012, 2013, and 2015 qualified for inclusion in this study. In an effort to understand the role the ACA health insurance coverage played in ED utilization, all visits made to H1, H2, H3, and H4 EDs between this time period with a known payer type were included in the study. Any visits made to the four EDs within the time frame without a clearly defined or known payer type were excluded from the study.

Research Study Design

In order to answer the two research questions (What is the relationship between the insurance coverage expansion under Affordable Care Act and the number of emergency department visits? Did the Affordable Care Act's insurance expansion decrease the number of emergency department visits in Illinois?), a quantitative approach was taken with this dissertation study. All ED visits made to H1, H2, H3, and H4 were divided into those made in

2012, 2013 and 2015. The year of 2014 was not included in the study because the ACA was implemented in 2014 with enrollment running through March 31. These factors made 2014 atypical for a clear impact of ACA implementation. Therefore, 2014 was not included into the study.

The number of visits made in 2012, 2013, and 2015 were then classified per payer type as uninsured, insured, Medicaid, Medicare, and unknown. All the visits classified as uninsured, insured, Medicare, and Medicaid were included in the study while those visits classified as unknown were excluded. All the data received from all the EDs were verified with the source for the clarification of any missing data and methods of coding to ensure the accuracy and quality of number of ED visits included. All these data were entered into a table in preparation for analysis after verification of its accuracy. The number of visits were entered into Microsoft Excel classifying them into year, ED, and payer type.

An interrupted time series analysis of the quasi–experimental design was used in this study to establish the relationships between the ACA insurance expansion and ED visits. Interrupted time series was suited and appropriate for this analysis because this evaluation was an initial evaluation of the ACA implementation, and the randomized control trial approach was impractical (Bernal, Cummins, & Gasparrini, 2016; Biglan, Ary, & Wagenaar, 2000). This dissertation study was designed to evaluate the effectiveness of a population-level health intervention (ACA), and interrupted time series was more effective with multiple baseline studies (2012 and 2013 as pretest) and one posttest (2015) after ACA implementation (Bernal et al., 2016; Biglan et al., 2000).

In this interrupted time series design, although threatened by history in its internal validity due to lack of control over the possible coincidental occurrence of some extraneous

events (Portney & Watkins, 2009), all the ED visits served as their own control by repeated observation (measurement) pre-ACA and post-ACA implementation, two pre-intervention observations (2012 and 2013), and one post-intervention observation (2015). The contrast of the pre-ACA and post-ACA observations demonstrated the effects of insurance expansion under ACA on the number of ED visits as well as the number of visits made to the EDs prior to and post ACA implementation.

The research question was as follows: RQ = O1 O2 X O3 (RQ = Research question; O = Observation; X = Intervention). The pre-intervention (pretest) observations of visits made in 2012 (O1) and 2013 (O2) presented a control for analysis, and those visits made in 2015 (O3) presented post intervention (posttest) observation (i.e., ACA implemented in January 1, 2014). During the pretest (O1, O2) and posttest (O3), the Anderson's theoretical framework variables (enabling factors), insurance status (Medicare, Medicaid, insured, and uninsured) and number of ED visits (use of health care services) made to H1, H2, H3, and H4 EDs were assessed (see Figure 2). The interrupted time series was utilized to assess the total number of patients insured (enabling factor) by each individual payer type who visited each individual hospital ED and then all four hospitals globally (see Figure 2).

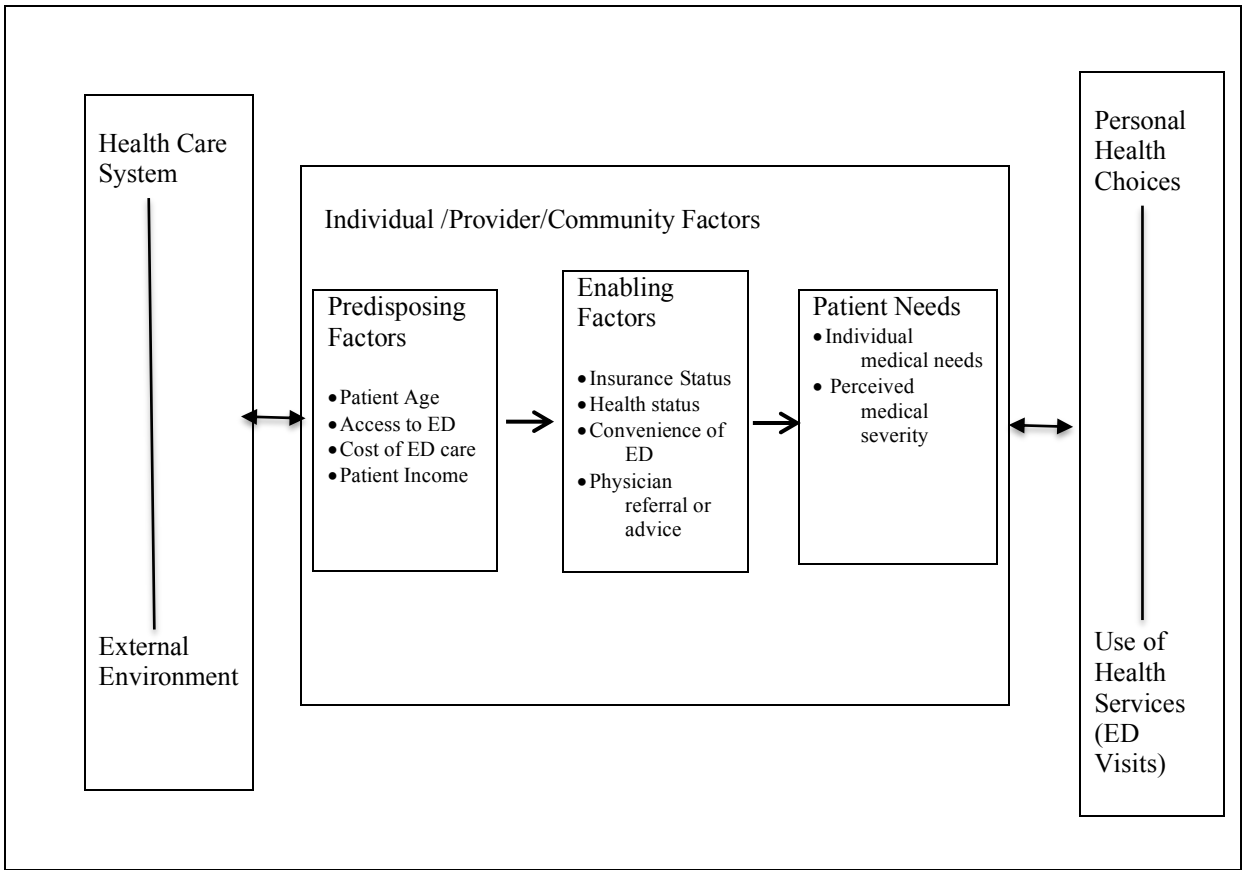

Figure 2. Applied Anderson theoretical model. Applied Anderson theoretical model of health care utilization to include the predisposing factors, enabling factors, and patient needs that influence ED utilization. Adapted from "Revisiting the Behavioral Model of Access to Medical Care: Does it matter?" By R. M. Anderson, 1995, *Journal of Health Care and Social Behavior, 36*, 1. Copyright 1995 by The American Sociological Association.

Institutional Review Board

An IRB application was submitted to the Nova Southeastern University (NSU) IRB, and an approval was obtained to continue with the submission of the IRB applications to the four hospital IRBs. The four individual hospital IRB approvals were obtained and submitted to the Nova Southeastern University IRB, and the final NSU IRB approval was received. After the IRB approval, data extraction was initiated. It was later discovered that one of the hospitals had closed its ED 2 years earlier and did not have any ED data post ACA implementation. An IRB amendment was filed to NSU after identifying another hospital ED to be included in the study to

substitute for the one ED that had been closed. Another IRB was submitted to the identified hospital after NSU IRB gave an approval for inclusion. An IRB approval was received from the identified hospital and submitted to NSU IRB. An NSU IRB amendment approval was received and proceeded with data collection.

Reliability and Validity

A quasi-experimental design interrupted time series, MANOVA, and canonical correlations were used to test for the correlation between ACA insurance expansion and the ED visits, whether the ACA insurance expansion decreased the number of ED visits, and the strength of the relationship between ACA insurance expansion and number of ED visits.

The main threats to validity of interrupted time series analysis were history, instrumentation, and simple selection (Matowe, Leister, Crivera, & Korth-Bradley, 2003). Whenever an event occurs other than the intervention (history), changes in the instruments (instrumentation) or a change in the composition of experimental group (simple selection) between pretest and posttest that might account for the observations, the validity of the study was threatened (Matowe et al., 2003; Portney & Watkins, 2009; Shadish, Cook, & Campbell, 2002).

Repeated testing (O1, O2, O3) using MANOVA to guard against instrumentation while observing for any changes in the databases, record keeping systems, and personnel changes was used in the dissertation study. The investigator contacted the corporate revenue recycling director to verify how the data were collected and the methods of record keeping utilized to ensure heterogeneity across multiple sites because the study was on secondary or existing data from multiple sites (Matowe et al., 2003; Shadish et al., 2002).

An exhaustible historical analysis was used in this dissertation study to rule out any other events other than ACA insurance expansion that might account for any changes in the number of

ED visits to the four hospital EDs over the study period. Data collection and classifications were made for various payer types in multiple hospital EDs and multiple years. Performing multiple pretesting (2012 and 2013) and posttesting (2015), which made each of the ED visits for each individual hospital ED their own control group, eliminated the potential for simple selection threat to validity (Matowe et al., 2003).

The multiple testing (measurements) utilizing similar tools (MANOVA and canonical correlations) in multiple hospital EDs to maintain consistency and free the possibility of errors increased the reliability of the dissertation study findings. All ED visits were classified into four consistent payer type categories throughout the four hospital EDs over the three-year study period to increase measurability. Interrupted time series analysis was done in 2012, 2013, and 2015 (multiple measurements) in each individual hospital ED. The individual hospital findings were then compared with those of all the four hospital EDs. These multiple measurements and multiple hospital EDs utilizing the same instrumentation increased probability of reproducibility or dependability of this dissertation study findings.

Data Collection

The data collection started immediately after IRB amendment approval was received. The four hospitals' ED medical directors were contacted through email, followed by several telephone conversations asking for their willingness to participate in the study and answering any of their questions. The hospitals' ED medical directors requested more time to retrieve the data and email them back to the investigator. After several weeks, emails were received from the medical directors, indicating that they did not have the 2012 and 2013 ED data because they had changed their electronic medical records (EMR) at the beginning of 2014 and recommended for the investigator to contact the corporate medical director. The corporate medical director was

then contacted via email, followed by several telephone calls about the desired data and the limitations the hospitals' medical directors were having in obtaining the data. The email was forwarded to the corporate revenue recycling director who pulled the data together and emailed the data in a Microsoft excel spreadsheets to the investigator.

Upon receipt, the secondary data were reviewed, tracking the number of visits made and the health insurance each individual patient seen in the ED carried. After review of the data, some visits were lacking their respective payer type. The corporate revenue recycling director was contacted for clarification. After review of the data, she requested more time to retrieve the data and counter checking them to ensure the data were coded properly.

After a few days, a revised Microsoft Excel spreadsheet was received, which included all the missing data. The investigator then contacted the corporate revenue recycling director to confirm that the data were accurate and to ensure that the data were not just created to fill in the empty slots (ensure the quality of the data). After thorough verification, the number of visits were classified into those made by the patients with Medicare, Medicaid, private insurance (insured), uninsured, and unknown for each individual ED and each year. The numerical data were recorded into a table (see Table 1) without any patient identifiers to ensure that patients' privacy was maintained.

Table 1
Total ED Visits to the Four Hospitals

Hospital	Year	Medicare		Medicaid		Insured		Uninsured		Unknown		Total
		Visits	%	Visits	%	Visits	%	Visits	%	Visits	%	
H1	2012	13,577	34.25	7,213	18.20	14,182	35.78	4,446	11.22	221	0.56	39,639
	2013	13,193	34.68	6,787	17.84	13,644	35.87	3,965	10.42	453	1.19	38,042
	2015	14,083	34.42	9,316	22.77	14,535	35.52	2,540	6.21	442	1.08	40,916
H2	2012	7,945	21.80	14,635	40.16	7,184	19.71	6,435	17.66	243	0.67	36,442
	2013	7,916	22.28	14,436	40.63	7,328	20.62	5,611	15.79	242	0.68	35,533
	2015	8,404	23.43	16,099	44.88	7,766	21.65	3,365	9.38	236	0.66	35,870
H3	2012	6,508	32.94	3,973	20.11	7,516	38.04	1,698	8.59	61	0.31	19,756
	2013	6,382	33.25	4,055	21.12	7,129	37.14	1,488	7.75	142	0.74	19,196
	2015	6,703	32.96	4,708	23.15	7,760	38.16	1,039	5.11	124	0.61	20,334
H4	2012	11,590	16.60	35,092	50.25	11,935	17.09	10,982	15.73	232	0.33	69,831
	2013	11,593	18.12	30,878	48.26	11,577	18.09	9,731	15.21	203	0.32	63,982
	2015	12,169	18.66	34,034	52.20	13,524	20.74	5,272	8.09	202	0.31	65,201

Data Preparation

The Microsoft excel spreadsheets, which were received, included the record of the number of visits made to the ED each month and the respective payer type. The spreadsheets were reviewed for visits made to the EDs of H1, H2, H3, and H4 between (a) January 1, 2012, to December 31, 2012; (b) January 1, 2013, to December 31, 2013; and (c) January 1, 2015, to December 31, 2015. The ED visits for 2014 were not included in study because it was the year ACA was implemented with enrollment running into March 31, and several computer glitches during enrollment hindering smooth transitions. Many of the enrollment glitches were not resolved until the end of the year. These issues did not make 2014 a typical year; therefore, it was excluded from the study.

All the ED visits made to each of the four EDs were recorded per payer type per each month for each year (2012, 2013, and 2015). All the four EDs were label as H1, H2, H3, and H4 for analysis purposes and concealment of facility identity. The visits were then classified into five payer type categories. The visits that were listed as made by Medicare and Medicare

managed care plans were classified into Medicare. Those listed as Medicaid, public aid, and Medicaid managed care plans were classified into Medicaid. Those listed with all other private health insurance plans, including workman's compensation, were classified as insured. Those listed as without any insurance plan were classified into uninsured while those listed as other and unknown payer source or payer type were classified as unknown (see Table 2).

Table 2
Plan Payer Classification

Payer plan	Payer type
Managed care	Insured
Self-Pay	Uninsured
Medicare	Medicare
Public aid	Medicaid
Commercial	Insured
Other/Unknown	Unknown
RAC—Auto and complex	Insured
Self-Pay	Uninsured
Medicaid	Medicaid
Worker's compensation	Insured
Blue Cross	Insured
Medicare managed care	Medicare
Medicaid managed care	Medicaid

The total number of visits made between January 1, 2012, to December 31, 2013, and January 1 to December 31, 2015, was stratified into payer type strata or subcategories (Medicaid, Medicare, insured, uninsured, and unknown) in an excel spreadsheet. The information was then transferred into a table (see Table 1) showing all four hospital EDs and total number of ED visits made to each hospital each year with its respective percentage. The data was then transferred to Statistical Package for the Social Sciences (SPSS) for analysis.

Data Analysis

The interrupted time series design with multiple pretests (2012, 2013) and posttest (2015) observations was used for analysis in this dissertation study. The data were then analyzed using

SPSS MANOVA to evaluate the relationship between the hospitals and years (2012, 2013, and 2015) as independent variables and the number of visits per payer type made to the EDs as dependent variables. The ED visits made into the four EDs in 2012 and 2013 were the control while those made in 2015 were the treatment group.

The ED visits made by the unknown patients were excluded while those visits made by Medicaid, Medicare, insured, and uninsured were included in the study. The number of visits made in 2012 and 2013 were then compared with those made in 2015 using MANOVA to determine the relationship between the number of ED visits per each payer type as dependent variables and the years (2012, 2013, 2015) and hospitals as independent variables. The total number of visits made to H1, H2, H3, and H4 in 2012, 2013, and 2015 were analyzed to determine the payer type that contributed significantly to ED overcrowding in each year and all the years collectively for each individual ED and all four EDs collectively. The pre-intervention observations (pretest) were those made in 2012 (O1) and 2013 (O2), and the post-intervention (posttest) were those made in 2015 (O3) for each individual hospital ED (H1, H2, H3, and H4) and all the four hospital EDs collectively.

The data analysis included examining the total number of visits made by each payer type each year, the payer type that had the largest number of visits each year and into each individual ED. The data were analyzed by reviewing for any pre-intervention trend, seasonality, and autocorrelation so as to assure the assumption of instance independence. This analysis was important as the data in this study were not randomly selected, and the variables were based on the same object. The analysis did not show any autocorrelation, thus an analysis of post-intervention observation proceeded observing for any partial autocorrelation, autocorrelation, or inverse autocorrelation (Munro, 2005; Portney & Watkins, 2009; Shadish et al., 2002).

The number of visits made in 2012 and 2013 provided a control, which were then compared with those made in 2015, using SPSS MANOVA, examining the relationship between the insurance expansion and the number of ED visits in each category. The MANOVA analysis demonstrated a significant Box's M ($p < .001$), indicating that the assumption of homogeneity of variance-covariance matrix was violated, thus rejecting the null hypothesis. These assumption testing findings indicated that the model was suspect with a potential for Type 1 error that needed another multivariate analysis as a follow-up or supplement method to eliminate a potential of finding statistically significant results when they really did not exist (Type 1 error). The assumption testing did not indicate any significant outliers, thus confirming that MANOVA was an appropriate analysis method for this study with Pillai's Trace instead of Wilks' lambda; however, a follow up method was needed to eliminate a potential for Type 1 error. A canonical correlation analysis was chosen as a follow-up or supplemental method as it was the most appropriate and powerful multivariate analysis that is robust that can simultaneously predict multiple dependent variables from multiple independent variables. It was also best suited to quantify the strength of the relationship and the extent to which the ACA insurance expansion predicted or explained the number of visits made to the EDs without placing many restrictions on the type of data.

The years, the payer type, and EDs were listed as independent variables while the number of visits were the dependent variable. The analysis was then conducted using SPSS MANOVA, observing for the payer type that recorded the highest number of visits for each ED and each year. The analysis was also done to compare the number of visits made in 2012 and those made in 2013 using MANOVA (testing for differences between the variables) establishing a baseline

change in the number of visits by each payer type. The changes between 2012 and 2013 were used for the control or the base, and those made in 2015 were the study group.

The analysis of data was also performed on each individual payer type for all four hospital EDs (Medicaid with Medicaid, Medicare with Medicare, insured with insured, and uninsured with uninsured) in each year and from year to year (2012, 2013 and 2015). An analysis was also undertaken comparing all four-payer types to determine the payer type that contributed significantly to the ED overcrowding.

An analysis was also performed comparing the number of visits of each payer type with the other three payer types to determine their relationship (Medicare with Medicaid; Medicare with insured; Medicare with uninsured; Medicaid with Medicare; Medicaid with insured; Medicaid with uninsured; insured with Medicare, insured with Medicaid; insured with uninsured; uninsured with Medicare; uninsured with Medicaid; and uninsured with insured).

Finally, the canonical correlation analysis was conducted as a follow-up to MANOVA to eliminate the potential of finding statistically significant results when they did not actually exist (Type 1 error) to compute the strength of the relationship between all the three independent variables (year, EDs, and payer types) and dependent variable (number of ED visits). Canonical correlation analysis also presented an opportunity to understand the contribution of the independent variable in predicting the composite of the dependent variable, and an explanation of the contribution the independent variable made to the dependent variable, which is the extent to which a change in year and hospital predicted or explained the number of visits made to the EDs.

Chapter 4: Results

Introduction

This chapter presents the findings of this dissertation study of the relationship between ACA and the number of ED visits and the effects of the ACA insurance expansion on the number of ED visits.

Study Findings

Descriptive Statistics

Population Size

A total of 484,742 visits were made to the four hospital EDs over the three-year study period of which a total of 2,801visits did not have a known payer type, which were excluded from the study. The exclusion of the unknown payer type reduced the sample size to a total of 481,941 visits for this dissertation study. H4 recorded the largest number of visit (69,599, 63,779, and 64,999 for 2012, 2013, and 2015, respectively) while H3 recorded the least number of visits (19,695, 19,054, and 20,210 for 2012, 2013, and 2015, respectively) as shown in Table 3.

Table 3
Sample Size: Total Number of ED Visits

Hospital	Year	Total ED visits	Visits excluded	Sample visits included
H1	2012	39,639	221	39,418
	2013	38,042	453	37,589
	2015	40,916	442	40,474
H2	2012	36,442	243	36,199
	2013	35,533	242	35,291
	2015	35,870	236	35,634
H3	2012	19,756	61	19,695
	2013	19,196	142	19,054
	2015	20,334	124	20,210
H4	2012	69,831	232	69,599
	2013	63,982	203	63,779
	2015	65,201	202	64,999
Total		484,742	2,801	481,941

Relationship between ACA and ED Visits

The purpose of this dissertation study was to examine the relationship between ACA insurance expansion and the number of visits to the EDs. It was also undertaken to investigate whether the ACA insurance expansion correlates with number of visits made to the EDs. The role of the uninsured in the ED overutilization was explored. In order to achieve these objectives, three research hypotheses were tested.

H_1: ACA insurance expansion will increase the number of people covered by health insurance. In general, the total number of people with various payer types decreased in 2013 and then increased in 2015. The people with Medicare, Medicaid, and insured decreased in 2013 and then increased in 2015, whereas the uninsured decreased both in 2013 and 2015 (see Table 4, Table 5, and Figure 3). The total number of people covered by health insurance post ACA

implementation increased by 14,184 from 2013 to 2015, and the uninsured decreased post ACA implementation by 8,576.

Table 4
Total Number of People per Payer Type

	Year 2012	Year 2013	Year 2015
Medicare	39,620	39,084	41,359
Medicaid	60,913	56,156	64,157
Insured	40,817	39,678	43,585
Uninsured	23,561	20,795	12,216

The total number of people covered by health insurance who visits the EDs in 2013 was 134,917 and 149,101 for 2015, an increase of approximately 11% from 2013 to 2015. After ACA implementation, the number of people who visited the EDs without insurance decreased by 41% while those with insurance (Medicaid, insured, and Medicare) increased by 4%. These findings indicated that ACA insurance expansion increased the aggregate number of people with health insurance coverage and decreased those without health insurance coverage who visited the four EDs in 2015 (see Table 5).

Table 5
Percentage Change of Payer Type

	2012-2013	2013-2015
Medicare	-1%	6%
Medicaid	-8%	14%
Insured	-3%	10%
Uninsured	-12%	-41%

The majority of the number of visits made to the four EDs were made by people covered by Medicaid throughout the study period while those without insurance made the least number of visits. The visits made by those with Medicare and with insurance did not change much with ACA implementation. The visits made by the uninsured had a steady decline post ACA

implementation (see Figure 3). In 2012, the uninsured made 23,561 visits to the EDs as compared with 12,216 visits in 2015.

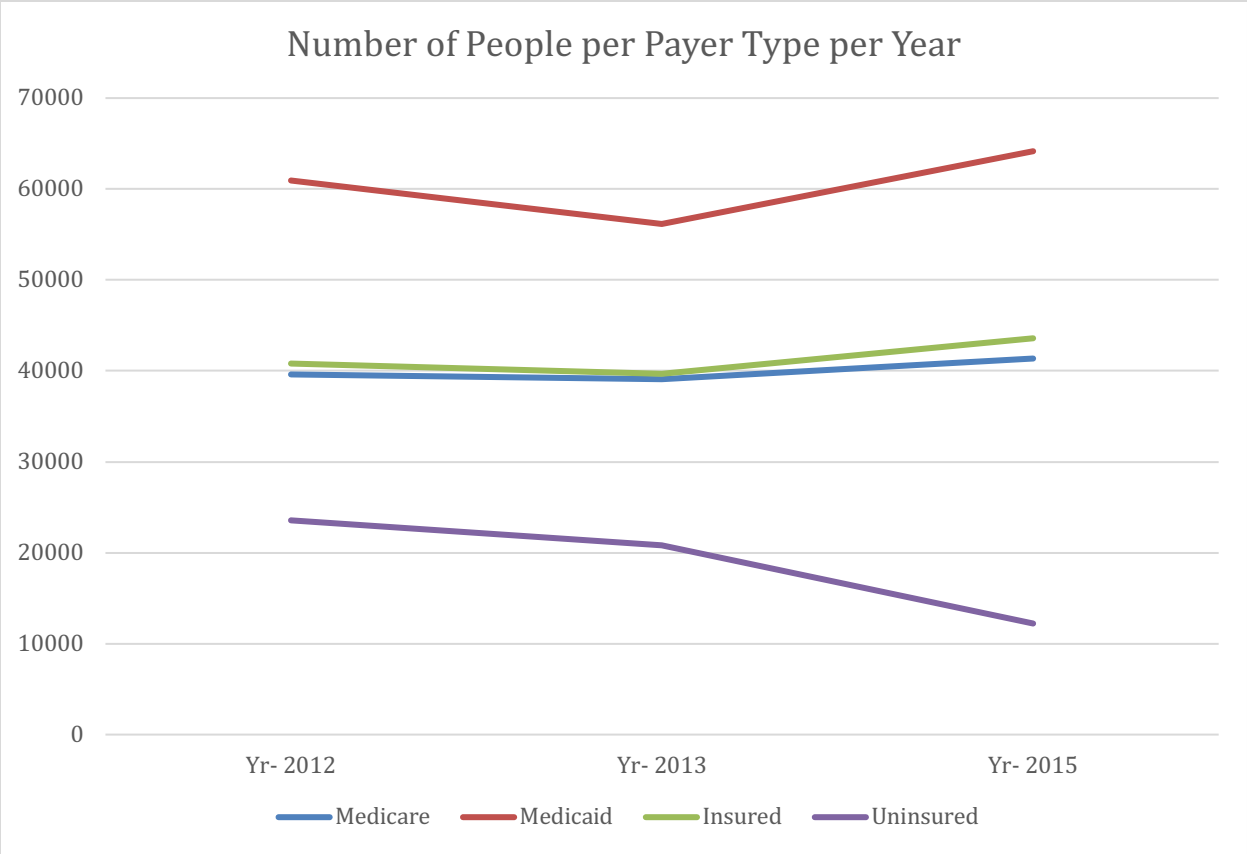

Figure 3. Number of people per payer type per year.

H_2: ACA insurance expansion will reduce the number of ED visits. The ED data demonstrated that a total number of visits made to the four EDs to be 484,742 over the three-year study period. There were 2,801 visits without a known payer type that were excluded, leaving 481,941 visits for this study (see Table 1). The study findings indicated that patients with Medicaid insurance recorded the highest number of visits followed by the insured patients and Medicare patients while the uninsured patients recorded the least the number of visits (see Table 4).

Analysis of the ED data showed that the number of visits made to the EDs of the four hospitals remained consistent across all the payer types throughout the study period. The total number of ED visits made by Medicare patients declined from 2012 to 2013 and then increased in 2015. Those with Medicaid insurance also declined from 2012 to 2013 and then increased in 2015 for all EDs except H3 in which the visits increased consistently from 2012 to 2013 and 2015. The visits made by the insured patients also decreased from 2012 to 2013 and then increased in 2015 for all EDs except H2 in which the visits increased consistently from 2012 to 2013 and 2015. The number of visits made by the uninsured patients had a steady decrease from 2012 to 2013 and 2015 across all the four EDs as shown in Table 5.

H_3: ACA insurance expansion will increase access to health services, including primary care services, thus reducing the number of people seeking care at EDs. The number of people seeking EDs services in 2015 increased from 155,713 in 2013 to 161,317. The overall number of people without insurance seeking ED services decreased by 41% while those seeking ED services with insurance increased by 4% (see Table 4 and 5). These findings indicated that despite an increase in the number of people covered by insurance, the number of visits to the four EDs did not decrease. The overall number of visits to the EDs in 2015 increased by approximately 4.5%.

These findings demonstrated that the people without health insurance did not comprise the majority of the people who sought health care services at the four EDs. The majority of the number of visits made to the EDs were by those people with Medicaid insurance while the uninsured comprised the least number of people seeking care at the EDs. The people with Medicare and private insurance stayed consistent prior to ACA implementation and post ACA implementation.

Total Number of Visits

The number of ED visits made were 164,911, 155,713, and 161,317 in 2012, 2013, and 2015, respectively, to all the four EDs. The total number of visits made to all the four EDs was 481,941 over the study period. Patients with Medicaid made the most number of visits (181,226) while the uninsured made the least number of visits (56,572). There was an overall decline of the total number of visits made to the EDs of 9,198 from 2012 to 2013 with a subsequent increase of 5,604 from 2013 to 2015 (post ACA implementation). The number of ED visits made for each individual payer type were different from year to year. The total number of visits made by the insured and Medicare patients from year to year were not statistically different $p < .207$ and $p < .589$, respectively, (see Figure 12) while those made by the uninsured and Medicaid patients were statistically different from year to year ($p < .001$) as shown in Table 1 and Figure 12.

The estimated marginal mean of all the payer types per year demonstrated that Medicaid patients recorded the highest number of visits to the EDs while the uninsured patients recorded the least. Medicaid patients had a mean of 1,258.5 with a standard deviation of 950, insured patients had a mean of 861.7 with standard deviation of 259.4, Medicare patients had a mean of 833.8 with standard deviation of 243.3, and the uninsured patients had a mean of 392.9 with a standard deviation of 255.2 (see Table 6). The people with Medicaid were the major contributor to the ED overcrowding over the study period.

Table 6
Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard deviation	Variance
Insured	144	499	1,433	861.67	259.376	67,276.084
Uninsured	144	52	1,068	392.86	255.210	65,131.897
Medicaid	144	277	3,426	1,258.51	950.031	902,558.615
Medicare	144	455	1,264	833.77	243.330	59,209.618
Valid *N* (list-wise)	144					

Inferential Statistics

The number of visits made to the EDs in 2015 by the people with Medicaid increased while those visits by the uninsured decreased. The estimated marginal mean for Medicaid patients in 2015 was 1336.6 with 95% CI [1062.5, 1610.8] while the mean for 2012 was 1269.0 with 95% CI [970.9, 1567.2]. The marginal mean for the uninsured patients for 2015 was 254.5 with 95% CI [216.2, 292.8] while that of 2012 was 490.9 with 95% CI [406.7, 575.0]. The number of visits made by those with Medicare and the insured patients did not have a statistically significant change across the study period. The mean for Medicare patients in 2015 was 861.7 with 95% CI [788.5, 934.8] while in 2012 was 825.4 with 95% CI [754.9, 896.0]. The mean for the insured patients for 2015 was 908.0 with 95% CI [827.3, 988.7] while in 2012 was 850.4 with 95% CI [776.4, 924.3]. The majority of the visits to EDs were made by the people with Medicaid while the uninsured patients made the least number of visits (see Table 7).

Table 7
Yearly Payer Type Means

		N	Mean	*SD*	SE	95% CI for mean		Min	Max
						Lower bound	Upper bound		
Uninsured	2012	48	490.9	289.9	41.8	406.7	575.0	105	1068
	2013	48	433.2	256.4	37.0	358.8	507.7	90	902
	2015	48	254.5	131.9	19.0	216.2	292.8	52	506
	Total	144	392.9	255.2	21.2	350.8	434.9	52	1068
Medicaid	2012	48	1269.0	1026.7	148.2	970.9	1567.2	277	3426
	2013	48	1169.9	886.7	128.0	912.5	1427.4	299	3074
	2015	48	1336.6	944.2	136.3	1062.5	1610.8	311	3180
	Total	144	1258.5	950.0	79.2	1102.0	1415.0	277	3426
Medicare	2012	48	825.4	243.0	35.1	754.9	896.0	484	1264
	2013	48	814.2	237.3	34.3	745.3	883.2	456	1234
	2015	48	861.7	252.0	36.4	788.5	934.8	455	1251
	Total	144	833.8	243.3	20.3	793.7	873.9	455	1264
Insured	2012	48	850.4	254.6	36.8	776.4	924.3	541	1261
	2013	48	826.6	243.0	35.1	756.0	897.2	499	1241
	2015	48	908.0	277.9	40.1	827.3	988.7	544	1433
	Total	144	861.7	259.4	21.6	818.9	904.4	499	1433

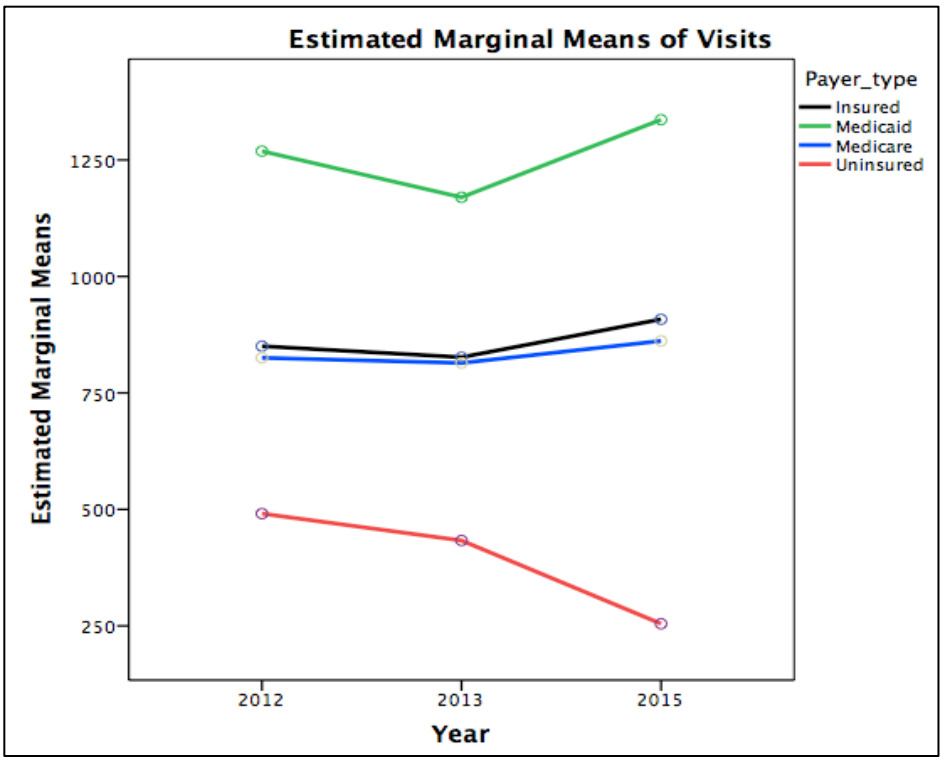

Figure 4. Profile plot: Estimated marginal means of visits per year.

The insured patients recorded the highest marginal means for H1, followed by Medicare patients, then Medicaid patients while uninsured patients recorded the least. The number of visits made in 2015 to H1 by people with Medicaid increased while those made by the uninsured decreased (see Figure 5). The insured and Medicare patients demonstrated no statistically significant difference in their marginal means throughout the study period.

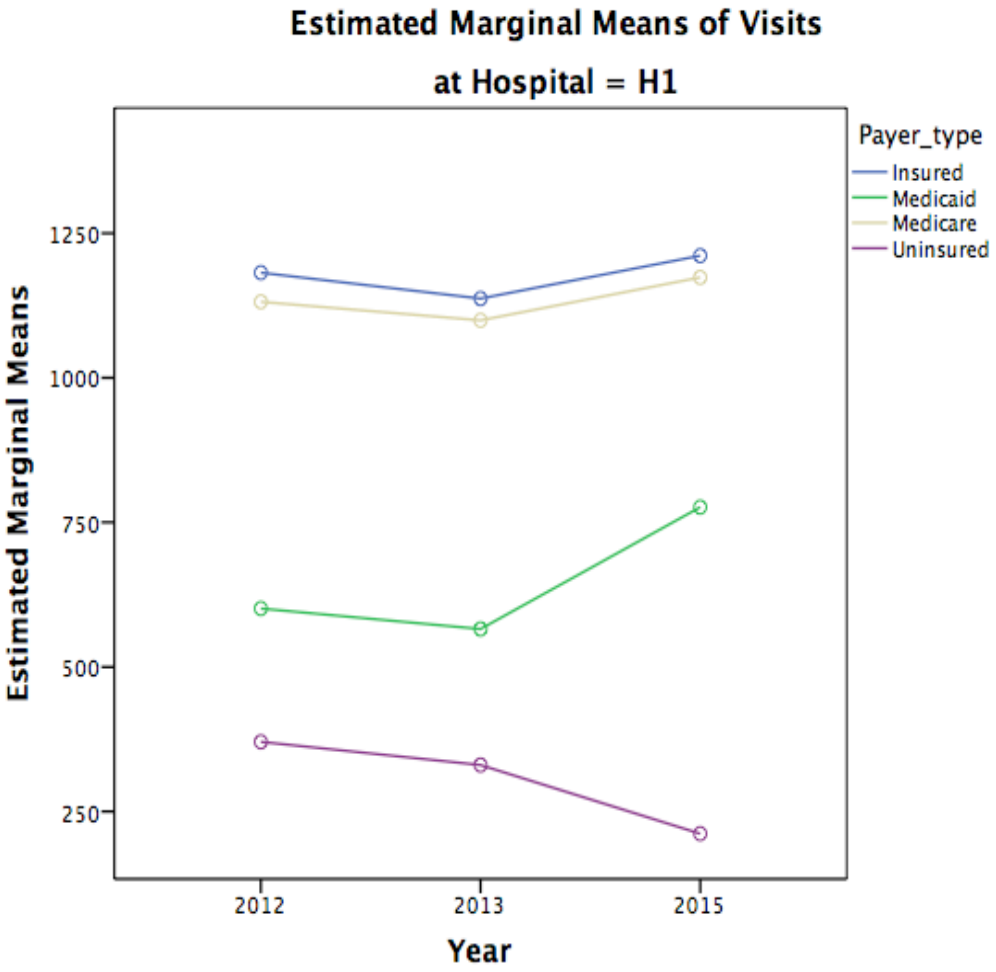

Figure 5. Marginal means for H1.

The Medicaid patients recorded the highest estimated marginal mean, followed by the insured and Medicare patients while the uninsured patients recorded the least estimated marginal mean for H2. The majority of the number of visits made to H2 were those made by people with Medicaid and those without insurance made the least number of visits (see Figure 6). The number of visits made by the insured and Medicare patients stayed close to the same while those visits made by Medicaid and uninsured patients increased and decreased, respectively, in 2015.

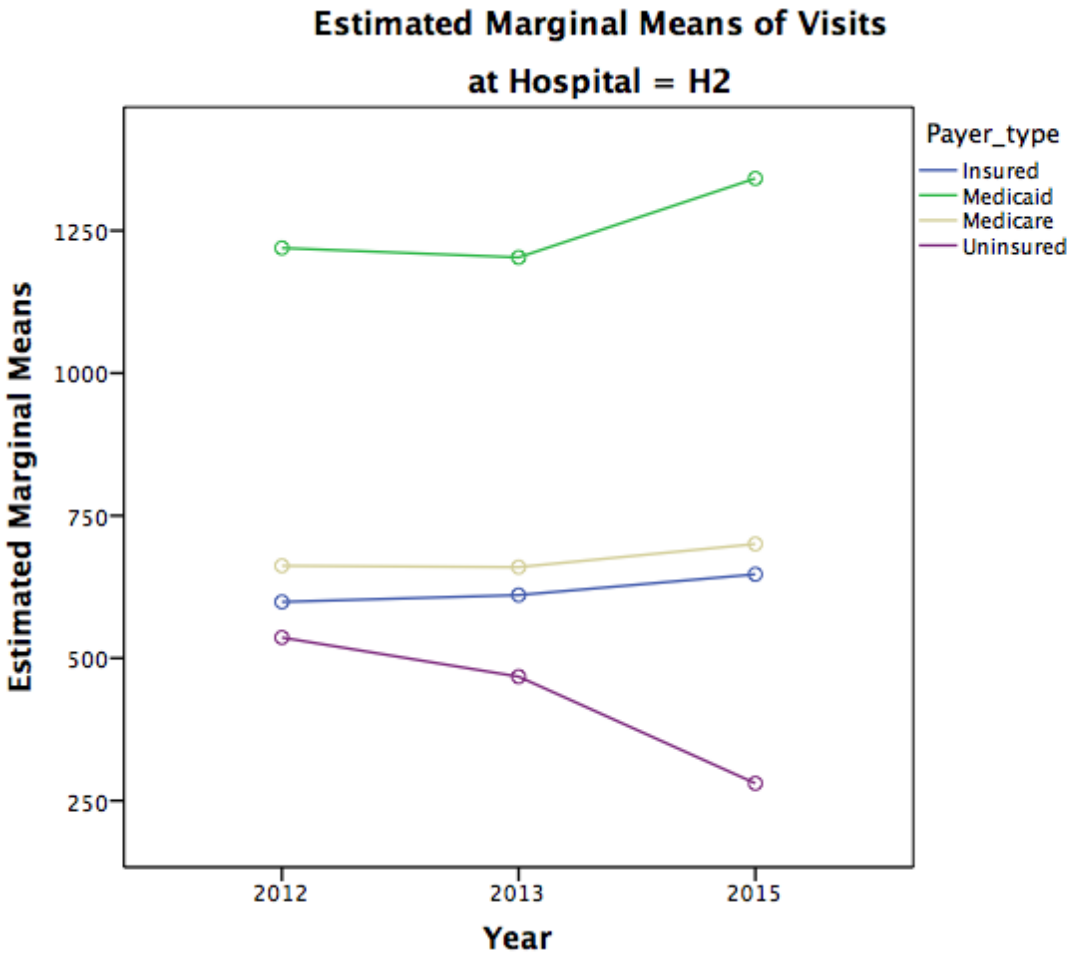

Figure 6. Estimated marginal means for H2.

The estimated marginal mean for H3 was similar to those of H1. Insured patients recorded the highest estimated marginal means, followed by Medicare patients, then Medicaid and the uninsured patients recording the least estimated marginal means. The people without insurance made the least number of ED visits to H3 while the insured patients made the most number of ED visits (see Figure 7). The ED visits made by the insured and Medicare patients did not have much change post ACA implementation while those made by Medicaid and uninsured patients increased and decreased respectively in 2015.

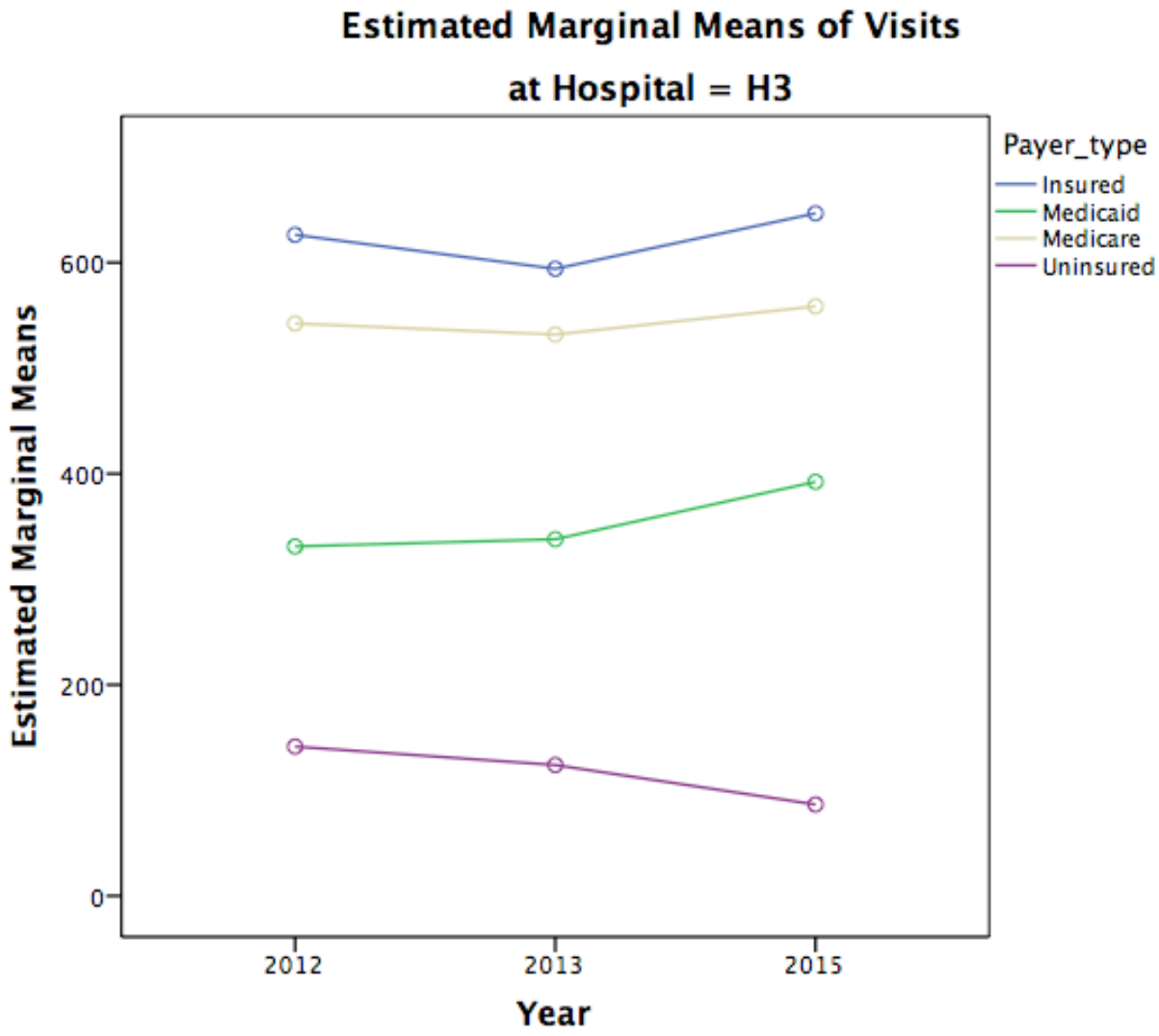

Figure 7. Estimated marginal means for H3.

The estimated marginal means for H4 was similar to that of H2. The people with Medicaid recorded the highest number of ED visits while the uninsured patients recorded the least number of visits. The people with Medicare insurance and the insured patients were consistent throughout the study period. The number of visits to the ED for Medicaid patients declined 2013 and then increased in 2015 while the number of ED visits for uninsured patients declined consistently from 2012 to 2105 (see Figure 8).

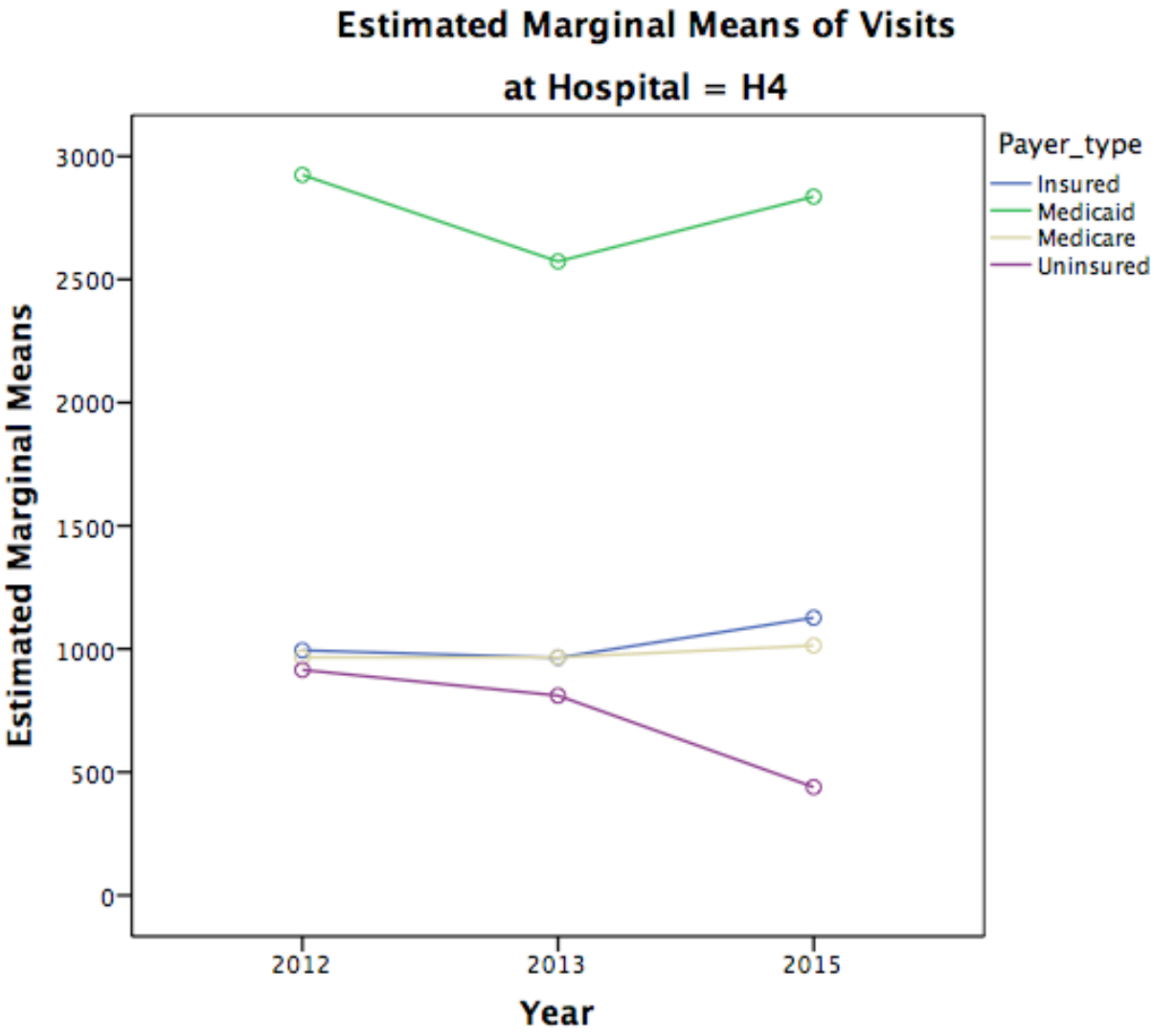

Figure 8. Estimated marginal means of H4.

The total number of ED visits made by the uninsured patients to all EDs declined consistently from 2012 to 2013 and 2015. The number of ED visits made by the uninsured patients to H1 was 11.2%, 10.4%, and 6.2%; H2 was 17.7%, 15.8%, and 9.4%; H3 was 8.6%, 7.6%, and 5.1%; and H4 was 15.7%, 15.2%, and 8.1% for 2012, 2103, and 2015, respectively (see Table 1). These findings demonstrated a significant drop of the total number of ED visits made by the uninsured patients in 2015 to an average of 7.2% from 13.3% and 12.8% for 2012 and 2013, respectively.

The total number of visits made to the EDs by the insured patients was consistently the same from year to year as shown in Table 1. The number of ED visits to H1 was 35.8%, 35.9%, and 35.5%; H2 was 19.7%, 20.6%, and 21.7%; H3 was 38.0%, 37.1%, and 38.2%; and H4 was 17.1%, 18.1%, and 20.7% for 2012, 2013, and 2015, respectively (see Table 1). The number of visits made by the insured patients remained consistent in each ED before and after ACA implementation.

The total number of visits made by Medicare patients was also consistent from year to year as shown in Table 1. The total number of Medicare visits made to H1 was 34.3%, 34.7%, and 34.4%; H2 was 21.8%, 22.3%, and 23.4%; H3 was 32.9%, 33.3%, and 33%; and H4 was 16.6%, 18.1%, and 18.7% for 2012, 2013, and 2015, respectively (see Table 1). The Medicare patient visits also remained the same for each ED before and after ACA health insurance expansion.

The total number of visits made by Medicaid patients to H1 was 18.2%, 17.8%, and 22.8%; H2 was 40.2%, 40.6%, and 44.9%; H3 was 20.1%, 21.1% and 23.2%; and H4 was 50.3%, 48.3% and 52.2% for 2012, 2013, and 2015, respectively. The total number of visits made by Medicaid patients to all four EDs increased by between 4% to 5% in 2015 (see Table 1). The number of visits made to the EDs by those people who had Medicaid increased across all the four EDs after ACA implementation.

Correlation of the Variables

MANOVA analysis of the relationship between the ACA insurance expansion and number of visits made to the EDs was statistically significant ($p < .001$). MANOVA analysis Pillai's Trace for the year was 1.091, $F(8, 260) = 39.044$, $p < .001$; for hospital was 2.566, $F(12, 393) = 193.642$, $p < .001$; combined hospital and year was 1.119, $F(24, 528) = 8.547$, $p < .001$

(see Table 8). The findings indicated there was a significant effect of year, hospital, and year-hospital combined for the number of visits made to the EDs. The ACA insurance expansion in 2015 increased the number of people with insurance and reduced those people without insurance. A majority of the ACA insurance expansion affected Medicaid and uninsured.

Table 8
MANOVA Results

Effect		Value	*F*	Hypothesis *df*	Error *df*	Sig.	Partial eta squared
Intercept	Pillai's trace	.997	10491.000[b]	4.000	129.000	.000	.997
	Wilks' lambda	.003	10491.000[b]	4.000	129.000	.000	.997
	Hotelling's trace	325.302	10491.000[b]	4.000	129.000	.000	.997
	Roy's Largest Root	325.302	10491.000[b]	4.000	129.000	.000	.997
Hospital	Pillai's trace	2.566	193.642	12.000	393.000	.000	.855
	Wilks' lambda	.000	726.752	12.000	341.593	.000	.944
	Hotelling's trace	118.457	1260.250	12.000	383.000	.000	.975
	Roy's largest root	94.542	3096.255[c]	4.000	131.000	.000	.990
Year	Pillai's trace	1.091	39.044	8.000	260.000	.000	.546
	Wilks' lambda	.083	79.772[b]	8.000	258.000	.000	.712
	Hotelling's trace	8.962	143.391	8.000	256.000	.000	.818
	Roy's largest root	8.721	283.423[c]	4.000	130.000	.000	.897
Hospital * Year	Pillai's trace	1.119	8.547	24.000	528.000	.000	.280
	Wilks' lambda	.150	13.587	24.000	451.237	.000	.378
	Hotelling's trace	3.961	21.043	24.000	510.000	.000	.498
	Roy's largest root	3.506	77.128[c]	6.000	132.000	.000	.778

Note: a. Design: Intercept + Hospital + Year + Hospital * Year
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

A test between subject effects indicated that year and payer type had statistical significant differences. The insured score was $F(2, 132) = 18.106$, $p < .001$; uninsured score was $F(2, 132) = 379.542$, $p < .001$; Medicaid score was $F(2, 132) = 24.912$, $p < .001$; and Medicare score was $F(2, 132) = 9.516$, $p < .001$; The test between subject effects of hospital and payer type showed statistical significant differences. The insured score was $F(3, 132) = 628.749$, $p < .001$; uninsured score was $F(3, 132) = 1207.040$, $p < .001$; Medicaid score was $F(3, 132) = 3101.336$, $p < .001$; and Medicare score was $F(3, 132) = 860.016$, $p < .001$. The year and hospital intercept

with all payer types were statistical significant except with Medicare scores. The insured score was $F(6, 132) = 2.745$, $p = .015$; uninsured score was $F(6, 132) = 56.123$, $p < .001$; Medicaid score was $F(6, 132) = 7.338$, $p < .001$; and Medicare score was $F(6, 132) = .519$, $p = .793$ (see Table 9).

Table 9
Between Subjects Effect of Year, Hospital, and Year-Hospital on Payer Types

Source	Dependent variable	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta squared
Corrected Model	Insured	9007275.667[a]	11	818843.242	176.266	.000	.936
	Uninsured	9060315.389[b]	11	823665.035	428.813	.000	.973
	Medicaid	127278165.139[c]	11	11570742.285	854.351	.000	.986
	Medicare	8058211.688[d]	11	732564.699	236.563	.000	.952
Intercept	Insured	106915600.000	1	106915600.000	23014.937	.000	.994
	Uninsured	22224938.778	1	22224938.778	11570.657	.000	.989
	Medicaid	228075438.028	1	228075438.028	16840.451	.000	.992
	Medicare	100105027.562	1	100105027.562	32326.408	.000	.996
Year	Insured	168220.792	2	84110.396	18.106	.000	.215
	Uninsured	1458048.764	2	729024.382	379.542	.000	.852
	Medicaid	674781.847	2	337390.924	24.912	.000	.274
	Medicare	58937.792	2	29468.896	9.516	.000	.126
Hospital	Insured	8762536.833	3	2920845.611	628.749	.000	.935
	Uninsured	6955454.889	3	2318484.963	1207.040	.000	.965
	Medicaid	126007074.972	3	42002358.324	3101.336	.000	.986
	Medicare	7989622.076	3	2663207.359	860.016	.000	.951
Year * Hospital	Insured	76518.042	6	12753.007	2.745	.015	.111
	Uninsured	646811.736	6	107801.956	56.123	.000	.718
	Medicaid	596308.319	6	99384.720	7.338	.000	.250
	Medicare	9651.819	6	1608.637	.519	.793	.023
Error	Insured	613204.333	132	4645.487			
	Uninsured	253545.833	132	1920.802			
	Medicaid	1787716.833	132	13543.309			
	Medicare	408763.750	132	3096.695			
Total	Insured	116536080.000	144				
	Uninsured	31538800.000	144				
	Medicaid	357141320.000	144				
	Medicare	108572003.000	144				
Corrected Total	Insured	9620480.000	143				
	Uninsured	9313861.222	143				
	Medicaid	129065881.972	143				
	Medicare	8466975.438	143				

Note: a. R Squared = .936 (Adjusted R Squared = .931)
b. R Squared = .973 (Adjusted R Squared = .971)
c. R Squared = .986 (Adjusted R Squared = .985)
d. R Squared = .952 (Adjusted R Squared = .948)

Univariate analysis of variance (ANOVA) with Turkey honest significant differences (HSD) was conducted as a follow-up to MANOVA to test whether the means of all the different payer types and each year in each individual hospital were taken from the same sampling distributions. The ANOVA analysis for each individual payer type against each individual year demonstrated that the insured patients did not have a statistical significant difference between 2012 and 2013 ($p = .207$) but had a statistical significant difference between the years of 2012 and 2015 as well as 2013 and 2015 ($p < .001$). The uninsured patients demonstrated a statistical significant difference for years of 2012 and 2013 ($p < .001$), 2013 and 2015 ($p < .001$), and between 2012 and 2015 ($p < .001$). Medicaid patients also demonstrated a statistical significant difference between 2012 and 2013, 2013 and 2015 ($p < .001$), and 2012 and 2015 ($p = .014$). Medicare patients did not have a statistical significant difference between 2012 and 2013 ($p = .589$) but demonstrated a statistical significant difference between 2012 and 2015 as well as 2013 and 2015 ($p = .005$ and $p < .001$, respectively) as shown in Table 10.

Table 10
Multiple Comparison of Payer Type from Year to Year

Dependent variable	(I) Year	(J) Year	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval Lower bound	Upper bound
Insured	2012	2013	23.73	13.913	.207	-9.25	56.71
		2015	-57.67*	13.913	.000	-90.65	-24.69
	2013	2012	-23.73	13.913	.207	-56.71	9.25
		2015	-81.40*	13.913	.000	-114.38	-48.42
	2015	2012	57.67*	13.913	.000	24.69	90.65
		2013	81.40*	13.913	.000	48.42	114.38
Uninsured	2012	2013	57.63*	8.946	.000	36.42	78.83
		2015	236.35*	8.946	.000	215.15	257.56
	2013	2012	-57.63*	8.946	.000	-78.83	-36.42
		2015	178.73*	8.946	.000	157.52	199.94
	2015	2012	-236.35*	8.946	.000	-257.56	-215.15
		2013	-178.73*	8.946	.000	-199.94	-157.52
Medicaid	2012	2013	99.10*	23.755	.000	42.79	155.41
		2015	-67.58*	23.755	.014	-123.89	-11.27
	2013	2012	-99.10*	23.755	.000	-155.41	-42.79
		2015	-166.69*	23.755	.000	-223.00	-110.38
	2015	2012	67.58*	23.755	.014	11.27	123.89
		2013	166.69*	23.755	.000	110.38	223.00
Medicare	2012	2013	11.17	11.359	.589	-15.76	38.09
		2015	-36.23*	11.359	.005	-63.16	-9.30
	2013	2012	-11.17	11.359	.589	-38.09	15.76
		2015	-47.40*	11.359	.000	-74.32	-20.47
	2015	2012	36.23*	11.359	.005	9.30	63.16
		2013	47.40*	11.359	.000	20.47	74.32

Note: Tukey honest significant differences (HSD). Based on observed means.
The error term is mean square(error) = 3096.695.
*. The mean difference is significant at $p < .05$

The ANOVA analysis of the payer type against each individual hospital demonstrated that the insured had a statistical significant difference between H1 and H2, H1 and H3, H1 and H4, H2 and H4, and H3 and H4 ($p < .001$) while H2 and H3 did not have a statistical significant difference ($p = .996$). The uninsured patients had a statistical significant difference between H1 and H2, H1 and H3, H1 and H4, H2 and H4, H3 and H4, and H2 and H3 ($p < .001$). Medicaid patients demonstrated a statistical significant difference between H1 and H2, H1 and H3, H1 and H4, H2 and H4, H3 and H4, and H2 and H3 ($p < .001$). Medicare patients demonstrated a statistical significant difference between H1 and H2, H1 and H3, H1 and H4, H2 and H4, H3 and H4, and H2 and H3 ($p < .001$) as shown in Table 11.

Table 11
Multiple Comparison H1, H2, H3, and H4 with the Respective Payer Type

						95% Confidence interval	
Dependent variable	(I) Hospital	(J) Hospital	Mean difference (I-J)	Std. error	Sig.	Lower bound	Upper bound
Insured	H1	H2	557.86*	16.065	.000	516.06	599.66
		H3	554.33*	16.065	.000	512.53	596.14
		H4	147.92*	16.065	.000	106.11	189.72
	H2	H1	-557.86*	16.065	.000	-599.66	-516.06
		H3	-3.53	16.065	.996	-45.33	38.27
		H4	-409.94*	16.065	.000	-451.75	-368.14
	H3	H1	-554.33*	16.065	.000	-596.14	-512.53
		H2	3.53	16.065	.996	-38.27	45.33
		H4	-406.42*	16.065	.000	-448.22	-364.61
	H4	H1	-147.92*	16.065	.000	-189.72	-106.11
		H2	409.94*	16.065	.000	368.14	451.75
		H3	406.42*	16.065	.000	364.61	448.22
Uninsured	H1	H2	-123.89*	10.330	.000	-150.77	-97.01
		H3	186.83*	10.330	.000	159.95	213.71
		H4	-417.61*	10.330	.000	-444.49	-390.73
	H2	H1	123.89*	10.330	.000	97.01	150.77
		H3	310.72*	10.330	.000	283.84	337.60
		H4	-293.72*	10.330	.000	-320.60	-266.84
	H3	H1	-186.83*	10.330	.000	-213.71	-159.95
		H2	-310.72*	10.330	.000	-337.60	-283.84
		H4	-604.44*	10.330	.000	-631.32	-577.56
	H4	H1	417.61*	10.330	.000	390.73	444.49
		H2	293.72*	10.330	.000	266.84	320.60
		H3	604.44*	10.330	.000	577.56	631.32
Medicaid	H1	H2	-607.06*	27.430	.000	-678.43	-535.68
		H3	293.89*	27.430	.000	222.51	365.26
		H4	-2130.22*	27.430	.000	-2201.60	-2058.85
	H2	H1	607.06*	27.430	.000	535.68	678.43
		H3	900.94*	27.430	.000	829.57	972.32
		H4	-1523.17*	27.430	.000	-1594.54	-1451.79
	H3	H1	-293.89*	27.430	.000	-365.26	-222.51
		H2	-900.94*	27.430	.000	-972.32	-829.57
		H4	-2424.11*	27.430	.000	-2495.49	-2352.74
	H4	H1	2130.22*	27.430	.000	2058.85	2201.60
		H2	1523.17*	27.430	.000	1451.79	1594.54
		H3	2424.11*	27.430	.000	2352.74	2495.49
Medicare	H1	H2	460.78*	13.116	.000	426.65	494.91
		H3	590.56*	13.116	.000	556.43	624.69
		H4	152.81*	13.116	.000	118.68	186.94
	H2	H1	-460.78*	13.116	.000	-494.91	-426.65
		H3	129.78*	13.116	.000	95.65	163.91
		H4	-307.97*	13.116	.000	-342.10	-273.84
	H3	H1	-590.56*	13.116	.000	-624.69	-556.43
		H2	-129.78*	13.116	.000	-163.91	-95.65
		H4	-437.75*	13.116	.000	-471.88	-403.62
	H4	H1	-152.81*	13.116	.000	-186.94	-118.68
		H2	307.97*	13.116	.000	273.84	342.10
		H3	437.75*	13.116	.000	403.62	471.88

Note: Tukey HSD. Based on observed means.
The error term is Mean Square(Error) = 3096.695.
*. The mean difference is significant at the

Interaction Between Variables

The interaction between independent variables (hospitals and years) and dependent variables (payer types) showed a statistically significant relationship. The hospital and year had statistically significant effect on the number visits made by insured patients, $F(3, 132) = 628.75$, $p < .001$, and $F(2, 132) = 18.11$, $p < .001$ as well as the combined hospital and year, $F(6, 132) = 2.75$, $p = .015$. The hospital, the year, and the combined hospital and year demonstrated statistical significant effects on the uninsured patients, $F(3, 132) = 1207.04$, $p < .001$; $F(2, 132) = 379.54$, $p < .001$; and $F(6, 132) = 56.12$, $p < .001$, respectively. The hospital, the year, and the hospital-year intercept had statistical significant effects on Medicaid patients, $F(3, 132) = 3101.34$, $p < .001$; $F(2, 132) = 24.91$, $p < .001$; and $F(6, 132) = 7.34$, $p < .001$, respectively. The hospital and the year had statistically significant effects on Medicare patients, $F(3, 132) = 860.02$, $p < .001$, and $F(2, 132) = 9.52$, $p < .001$, respectively while hospital-year intercept did not have a statistically significant effect on Medicare patients, $F(6, 132) = .52$, $p = .793$ (see Table 9).

Multiple comparison of payer types demonstrated statistically significant differences except Medicare and insured patients, which were non-significant (see Table 12). Insured interaction with Medicaid and uninsured patients demonstrated a statistically significant difference ($p < .001$) while it demonstrated non-significant difference with Medicare patients ($p = .969$). Medicaid interactions between Medicare, insured, and uninsured patients were statistically significant ($p < .001$). Medicare interaction between all other payer types (Medicaid and uninsured) were statistically significant ($p < .001$) except insured patients, which was non-significant ($p = .969$). The uninsured interaction between other payer types (Medicaid, Medicare, and insured) were statistically significant ($p < .001$) as shown in Table 12.

Table 12
Multiple Comparison of Payer Sources

(I) Payer_type	(J) Payer_type	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval Lower bound	Upper bound
Insured	Medicaid	-396.85*	61.604	.000	-555.58	-238.11
	Medicare	27.90	61.604	.969	-130.84	186.63
	Uninsured	468.81*	61.604	.000	310.07	627.54
Medicaid	Insured	396.85*	61.604	.000	238.11	555.58
	Medicare	424.74*	61.604	.000	266.01	583.48
	Uninsured	865.65*	61.604	.000	706.92	1024.39
Medicare	Insured	-27.90	61.604	.969	-186.63	130.84
	Medicaid	-424.74*	61.604	.000	-583.48	-266.01
	Uninsured	440.91*	61.604	.000	282.18	599.64
Uninsured	Insured	-468.81*	61.604	.000	-627.54	-310.07
	Medicaid	-865.65*	61.604	.000	-1024.39	-706.92
	Medicare	-440.91*	61.604	.000	-599.64	-282.18

Note: Dependent variable: visits. Tukey HSD. Based on observed means.
The error term is Mean square (error) = 273239.733.
*. The mean difference is significant at $p < .05$.

Relationship Strength of the Variables

A canonical analysis was performed to evaluate the strength of the relationship among the variables and the extent to which the independent variable could predict or explain the value of the dependent variable. The results demonstrated that the hospital could predict or explain the variation of the Medicaid number of visits 97% of the time and 87.7% of the time for the uninsured number of visits while 11.4% and 17.2% for the insured and Medicare number of visits, respectively (see Figure 9). These findings demonstrated that the strength of the relationship between hospital and payer type was stronger with Medicaid and uninsured patients.

Canonical Analysis

H = Type III SSCP Matrix for Hospital
E = Error SSCP Matrix

	Canonical Correlation	Adjusted Canonical Correlation	Approximate Standard Error	Squared Canonical Correlation	Eigenvalues of Inv(E)*H = CanRsq/(1-CanRsq)				Test of H0: The canonical correlations in the current row and all that follow are zero				
					Eigenvalue	Difference	Proportion	Cumulative	Likelihood Ratio	Approximate F Value	Num DF	Den DF	Pr > F
1	0.994753	0.994571	0.000901	0.989533	94.5421	72.2550	0.7981	0.7981	0.00017105	726.75	12	341.59	<.0001
2	0.978293	0.978036	0.003696	0.957058	22.2872	20.6596	0.1881	0.9863	0.01634262	295.64	6	260	<.0001
3	0.787037	0.786700	0.032755	0.619427	1.6276		0.0137	1.0000	0.38057322	106.61	2	131	<.0001

Canonical Structure

	Total			Between			Within		
	Can1	Can2	Can3	Can1	Can2	Can3	Can1	Can2	Can3
Insured	0.1146	0.9722	0.1945	0.1369	0.9846	0.1089	0.0532	0.7884	0.3226
Uninsured	0.8773	0.1611	-0.4859	0.9476	0.2805	-0.1528	0.5105	0.3112	-0.6272
Medicaid	0.9700	0.1747	0.0582	0.9856	0.1668	0.0276	0.8510	0.2966	0.1814
Medicare	0.1727	0.9705	0.0065	0.1866	0.9786	-0.0868	0.0849	0.9164	-0.3008

Figure 9. Canonical correlation between hospital and payer sources.

The relationship between hospital and payer type demonstrated a statistically significant relationship of Wilks' Lambda of 0.00017105, $F = 726.75$ (8, 258), $p < .001$ (see Figure 10).

MANOVA Test Criteria and *F* Approximations for the Hypothesis of No Overall Hospital Effect
H = Type III SSCP Matrix for Hospital
E = Error SSCP Matrix

S = 3 *M* = 0 *N* = 63.5

Statistic	Value	*F* Value	Num *DF*	Den *DF*	Pr > *F*
Wilks' lambda	0.00017105	726.75	12	341.59	<.0001
Pillai's trace	2.56601808	193.64	12	393	<.0001
Hotelling-Lawley trace	118.45690559	1265.09	12	221.48	<.0001
Roy's greatest root	94.54212431	3096.25	4	131	<.0001

Note: F statistic for Roy's greatest root is an upper bound.

Figure 10: MANOVA matrix for hospital and payer type.

The analysis also demonstrated that year could also explain or predict the variation of Medicaid visits 52.5%: uninsured 82.6%, insured 27.9%, and Medicare 16.4% (see Figure 11).

Canonical Analysis

H = Type III SSCP Matrix for Year
E = Error SSCP Matrix

	Canonical Correlation	Adjusted Canonical Correlation	Approximate Standard Error	Squared Canonical Correlation	Eigenvalues of Inv(E)*H = CanRsq/(1-CanRsq)				Test of H0: The canonical correlations in the current row and all that follow are zero				
					Eigenvalue	Difference	Proportion	Cumulative	Likelihood Ratio	Approximate F Value	Num DF	Den DF	Pr > F
1	0.947168	0.945887	0.008887	0.897127	8.7207	8.4795	0.9731	0.9731	0.08288088	79.77	8	258	<.0001
2	0.440839	0.428913	0.069599	0.194339	0.2412		0.0269	1.0000	0.80566128	10.45	3	130	<.0001

Canonical Structure

	Total		Between		Within	
	Can1	Can2	Can1	Can2	Can1	Can2
Insured	-0.2789	0.3205	-0.9046	0.4263	-0.1604	0.4546
Uninsured	0.8260	0.8529	0.9966	0.0829	0.8093	0.4047
Medicaid	0.5247	0.9965	-0.7071	0.7071	-0.1471	0.8845
Medicare	-0.1638	0.3572	-0.9286	0.3712	-0.1194	0.2870

Figure 11. Canonical correlation between year and payer type.

The Wilks' Lambda was statistically significant at .08288088, $F = 79.77$ (8, 258), $p <$ .001 (see Figure 12). These findings demonstrated that the relationship between year and payer type was strongest for the uninsured patients at 82.6% followed by the Medicaid patients at 52.5%, and was the weakest for Medicare patients. The ACA insurance expansion had a significant effect on the Medicaid and uninsured patients. The number of visits made to the EDs by the uninsured patients was the most affected followed by those made by Medicaid patients.

MANOVA Test Criteria and *F* Approximations for the Hypothesis of No Overall Year Effect
H = Type III SSCP Matrix for Year
E = Error SSCP Matrix

S = 2 *M* = 0.5 *N* = 63.5

Statistic	Value	*F* Value	Num *DF*	Den *DF*	Pr > *F*
Wilks' lambda	0.08288088	79.77	8	258	<.0001
Pillai's trace	1.09146561	39.04	8	260	<.0001
Hotelling-Lawley trace	8.96192946	143.85	8	181.98	<.0001
Roy's greatest root	8.72071305	283.42	4	130	<.0001

***Note: F* statistic for Roy's greatest root is an upper bound.**

***Note: F* statistic for Wilks' lambda is exact.**

Figure 12. MANOVA matrix for year and payer type.

Summary

These dissertation study findings demonstrated a total of 484,742 visits to all the four hospitals, of which, 2,801 visits were excluded due to secondary lack of clearly defined payer type. The study included a total of 481,941 visits for the study. Medicaid patients recorded the most number of visits at 60,913, 56,156, and 64,157 for 2012, 2013, and 2015, respectively, followed by insured patients at 40,817, 39,678, and 43,585; Medicare patients 39,620, 39,084, and 41,359; and the uninsured recorded the least number of visits at 23,561, 20,795, and 12,216 for 2012, 2013, and 2015, respectively.

H4 recorded the highest number of visits at 69,599, 63,779, and 64,999 for 2012, 2013, and 2015, respectively, followed by H1 at 39,418, 37,589, and 40,474; H2 with 36,199, 35,296, and 35,634, and H3 recorded the least number of visits at 19,695, 19,054, and 20,210. The total number of ED visits for each year was 164,911, 155,713, and 161,317 for 2012, 2013 and 2015, respectively.

These findings indicated that the total number of people not covered by insurance declined with ACA implementation. The total number of people covered by Medicare declined from 2012 to 2013 by 1%, then increased by 6% from 2013 to 2015. Those covered by Medicaid

declined by 8% from 2012 to 2013, then increased by 14% from 2013 to 2015. Those covered by private insurance declined by 3% from 2012 to 2013 then increased by 10% from 2013 to 2015. The uninsured patients declined by 12% from 2012 to 2103 and 41% from 2013 to 2015. The total number of visits to the EDs declined from 2012 to 2013 by 6% and then increased by 4% from 2013 to 2015.

The number of visits made by the uninsured was significantly affected by ACA insurance expansion. The number of visits made by the uninsured in 2015 to all four EDs declined significantly while those visits made by Medicaid patients increased. The number of visits made by private insurance and Medicare patients were the least affected. These findings demonstrated that the total number of visits made to the EDs by the uninsured patients declined after ACA was implemented although the overall number of visits to the four EDs increased.

The correlation between ACA insurance expansion and the number of visits made to EDs were the strongest with those visits made by people without health insurance coverage and those covered by Medicaid. The correlation between the ACA was weakest with those people covered by Medicare. The total number of visits made to the EDs increased after ACA implementation.

Chapter 5: Discussion, Conclusion, Implications, and Recommendations

Introduction

This chapter presents a summary of the dissertation study findings and the important conclusions drawn from chapter four. This chapter presents the discussion of the findings and its relationship to the existing literature. The chapter also presents the implications for actions, recommendations for further research, and limitations and delimitations of this study.

Findings Summary

This dissertation study was designed to evaluate the relationship of ACA insurance expansion and the total number of ED visits and to explore the role of the uninsured in ED utilization and overcrowding. This dissertation study included the review of secondary or existing ED records from H1, H2, H3, and H4 in 2012, 2013, and 2015. All the ED visits were classified into five payer type categories for each ED. All the visits with known payer type were included in the analysis while those with unknown payer type were excluded. The data were then entered into the SPSS program for analysis using quasi-experimental design interrupted time series utilizing MANOVA and canonical correlation.

Analysis of the ED data demonstrated that a total of 484,742 visits were made to the four hospital EDs over the three-year study period. There were 2,801 visits of the total visits that had an unknown payer type and were thus excluded from the study, leaving 481,941 visits for this study. The total number of ED visits were divided into those made prior to ACA and those made post ACA implementation. The results demonstrated that the total number of visits to EDs declined from 2012 to 2013 by 6% and then increased by 4% from 2013 to 2015. The study findings also indicated that Medicaid patients recorded the most number of visits for 2012, 2013, and 2015 while the uninsured patients recorded the least number of visits.

The study findings also indicated that the total number of people not covered by insurance declined, thus increasing the number of visits reimbursable by health insurance. Those covered by Medicare declined from 2012 to 2013 by 1%, then increased by 6% from 2013 to 2015 while those patients covered by Medicaid declined by 8% from 2012 to 2013, then increased by 14% from 2013 to 2015. The people covered by the private health insurance declined by 3% from 2012 to 2013 then increased by 10% from 2013 to 2015, whereas those uninsured declined by 12% from 2012 to 2103 and by 41% from 2013 to 2015.

The interaction between independent variables (hospital and year) and dependent variables (payer type) indicated a statistically significant relationship. MANOVA analysis results Pillai's Trace for year to be 1.091, $F(8, 260) = 39.044$, $p < .001$; for hospital 2.566, $F(12, 393) = 193.642$, $p < .001$; and, for hospital and year 1.119, $F(24, 528) = 8.547$, $p < .001$. A canonical correlation analysis demonstrated that the hospital could explain the variation of the Medicaid patients' number of visits 97% of the time and 87.7% of the time for the uninsured patients while 11.4% and 17.2% for the insured and Medicare patients, respectively. The Wilks' lambda was 0.00017105, $F = 726.75$ (8, 258), $p < .001$. The analysis also indicated that year could also explain variations in the number of ED visits by those made by Medicaid patients: 52. 5%, uninsured patients 82.6%, insured patients 27.9%, and Medicare patients 16.4%. The Wilks' lambda value was 0.08288088, $F = 79.77$ (8, 258), $p < .001$. The revelation of year presented a significant indication that the ACA had an impact on the number of visits made to the EDs in 2015 (post the ACA implementation). These findings showed that the ACA had a significant impact on the ED utilization and that there was a significant relationship between the ACA insurance expansion and the number of ED visits.

The study findings also demonstrated that the total number of visits to the EDs increased with ACA insurance expansion although the overall number of people with health insurance coverage increased and the number of uninsured patients dropped. Overall these findings indicated that the ACA implementation achieved one of its goals of expanding insurance coverage as noted by a 41% decreased in the number of visits by uninsured patients and the increase of insurance coverage by the other payer types between 2013 and 2015. The total number of people with health insurance coverage who visited the EDs after the ACA implementation increased while those patients without insurance decreased significantly.

Discussion

Number of ED Visits

Uninsured patients use of the ED has often been blamed for the rise in health care cost in the US. Review of the ED utilization presented an opportunity to understand the role of uninsured patients in ED overcrowding and the impact of the ACA insurance expansion on ED utilization. The total number of visits made to the four EDs over this study period were 481,941. The visits made prior to the ACA implementation were 164,911 for 2012 and 155,713 for 2013 while 161,317 were made in 2015 after the ACA had been implemented. This sample size was strong for the application of this study, especially when considering the impact of ACA insurance expansion on the total number of visits.

The study findings indicated a decline of the total number of visits from 2012 to 2013 (pre-ACA) and then an increase from 2013 to 2015 (post ACA implementation). This increase in the number of visits to EDs was corroborated by Clemons-Cope et al. (2013), who indicated that insurance expansion (Medicaid) had a potential for increased access to health care. These findings indicated that the ACA insurance expansion increased the total number of visits made to

EDs, which is also corroborated by Nikpay et al. (2017), who indicated that Medicaid expansion under ACA increased the number of visits made to EDs by 2.5 visits per 1,000 population.

These increases in the number of ED visits corroborated by Nikpay et al. (2017) and Clemons-Cope et al. (2013) indicated the potency of this research study. These findings will be significant in resolving the issue of uninsured and ED over utilization. The issue of overcrowding is complex and multifaceted as demonstrated by Anderson's theoretical framework and that the insurance status is not the exclusive issue that guides one's choice of health care consumption.

The total number of visits to all four EDs slumped from 2012 to 2013 and then increased from 2013 to 2015, despite the varying payer type mix. H4 recorded the highest number of ED visits, and H3 recorded the least number of visits. The number of visits made by the uninsured patients to H4 were 15.7%, 15.2%, and 8.1% for 2012, 2013, and 2015, respectively, and those visits made to H3 were 8.6%, 7.6%, and 5,1% for 2012, 2013, and 2015, respectively. It is also important to note that the decrease of the number of visits by uninsured patients did not make any statistically significant effect on the overall number of visits made to the EDs in 2015. The ACA insurance expansion implementation changed the overall ED case mix by increasing those people with Medicaid and reducing those without insurance. The study results indicated that the implementation of ACA demonstrated a decrease in the number of visits by the uninsured while the total number of visits made to EDs increased.

The study findings indicated a decrease of the number of ED visits from 2012 to 2013 and then an increase from 2013 to 2015 by all payer types (Medicare, Medicaid, and insured), except the uninsured patients, whose visits decreased from 2012 to 2013 and then 2013 to 2015. This unique response on the number of ED visits by the uninsured patients could be attributed to

the ACA insurance expansion. These findings confirmed that ED overcrowding is not as result of lack of insurance but due to other factors (Fisman, 2014; Taubman et al., 2014; Weber et al., 2008).

The study findings also confirmed Anderson's theoretical model of health care utilization that the decision to seek health care services is not only based on the insurance status but many other factors. The issue of ED utilization is more complex than just the health insurance status of its visitors. According Anderson's theoretical model, insurance status is an enabling factor together with health status, convenience of the ED, and the physician referral. These factors together with predisposing factors (age, access to ED, cost of ED, and patient income) and patient needs are contributing factors to ED utilizations. The Anderson model also indicates that the health care system and personal health choices supplement the predisposing factors, enabling factors, and patient individual needs to facilitate health services consumption.

Payer Type and ED Visits

The ACA insurance expansion changed the patient case mix in 2015. The total number of visits made to the EDs dropped in 2013 and then increased in 2015 by all other payer types except the uninsured whose visits decreased. Medicaid patients recorded the highest number of visits, followed by the insured patients (private insurance), then Medicare patients, and the uninsured patients recording the least number of ED visits for 2012, 2013, and 2015. The ACA insurance expansion affected the total number of visits by increasing those ED visits made by Medicare, private insurance (insured), and Medicaid patients from 2013 to 2015 while the number of visits by uninsured patients plunged by a bigger margin over the same time period.

The average number of ED visits by all payer types demonstrated that people with Medicaid made the most number of visits to all the EDs while the uninsured patients made the

least number of visits, thus, supporting researchers who cited Medicaid as the primary contributor to ED overcrowding (Baicker et al., 2013; Cheung et al., 2012; Fisman, 2014; Smulowitz et al., 2011; Tang et al., 2010; Taubman et al., 2014). The dissertation study findings also confirmed the results of other studies (Clemons-Cope et al., 2013; Decker et al., 2013; Lin et al., 2015) that demonstrated that people with Medicaid constituted the majority of the visitors to the EDs. These findings indicated the robustness of this research study as the changes in case mix are significant in decision making by health providers and health policy makers in trying to find solutions to the issue of ED crowding.

ACA and Cost of Health Care

The ED overcrowding has been attributed to the rising cost of health care (Fisman, 2014; Taubman et al., 2014; Weber et al., 2008). The uninsured patients have been associated with congestion of the EDs, which implies that the most health care services provided by the EDs were not paid for. It has been implicit that the EDs provided care that was not reimbursed, thus had to find ways of obtaining reimbursement for those uncompensated health care provided to the uninsured. For a long time, the rise in unreimbursed health care services provided in the EDs have been attributed to a significance increase in the health care cost (Anderson et al., 2014; Fisman, 2014; Rosenbaum, 2010). The significant increase in health care cost has been associated with the health care providers increasing the cost of health care so as to cover the unreimbursed health care delivered. The total number of visits made to the four EDs post ACA implementation was higher than those visits made in 2013 (pre-ACA), despite a significant decline in the number of visits made by the uninsured patients. These findings confirmed that the uninsured patients are not the cause of ED overcrowding although they contribute to overutilization.

The dissertation study findings also demonstrated that Medicaid patients had the most number of visits to EDs, refuting the long-held assumption that the ED overcrowding is caused by the uninsured who utilize the EDs for routine medical care that could be provided more cost effectively at the primary care level (Baicker et al., 2013; Cheung et al., 2012; Fisman, 2014; Smulowitz et al., 2011; Tang et al., 2010; Taubman et al., 2014). Although the dissertation study findings indicated that in aggregate Medicaid patients contributed the most number of visits to the EDs, Medicaid patients were not the major contributor to all four EDs when each ED was considered individually. The payer type that contributed the most number of ED visits to H1 and H3 was the insured patients (private insurance) while Medicaid patients contributed the most number of ED visits to H4 and H2. The uninsured patients made the least number of ED visits to all four EDs. These results could also be explained by the fact that the newly insured people often have difficulties accessing routine care promptly and thus are forced to utilize the EDs for their routine health care needs (Cheng et al., 2012; Pande et al., 2011). These findings demonstrated another potency of this study as they refuted the long-held assumption that lack of insurance was the main cause of overcrowding of the EDs.

The ACA insurance expansion increased the number of people covered by health insurance who made visits to EDs. The ACA was designed to expand insurance coverage to achieve universal or near universal coverage, thus decreasing uncompensated health care (Blumenthal et al., 2015; Sommers et al., 2015). The increase in the number of visits made to the EDs by those patients covered by Medicaid indicated that the services provided by the EDs were reimbursed by the payer type, despite the long-held notion that ED health care is unreimbursed (Cheng et al., 2012; Pande et al., 2011). Although the cause of rising cost of health care in this country has not been clearly known, there has been an assumption that the cost of health care

increase is caused by ED overutilization by the uninsured and thus increased care without reimbursement. The decrease of the uninsured visits to the EDs will decrease the health care services provided without reimbursement and thus has a potential to decrease the cost of health. The dissertation study findings could not, however, confirm whether the ACA insurance expansion had an effect on the cost of health care.

ACA and Quality of Health Care

The ED overcrowding has been attributed with increased rates of mortality and poor quality of care (Fisman, 2014; Taubman et al., 2014; Weber et al., 2008). The ACA was passed and implemented in an effort to tame the consistent rise in the cost of care, increase health insurance coverage, decrease health care discrimination, and improve the quality of health care (Antos, 2014; Blumenthal et al., 2015; Perez, 2013). The dissertation study findings indicated that there was an increase in the number of ED visits post ACA implementation, which implied that ACA health insurance expansion increased the ED overcrowding.

The rise in the number of visits made to the EDs post ACA insurance expansion indicated that lack of insurance is not the main cause of ED overcrowding and thus poor quality of care. These findings post ACA implementation continue to imply that the uninsured are not the primary and only cause for increased ED utilization. The ACA was designed in a way to change the health delivery system, promoting prevention, emphasizing care coordination, disease management, and administrative simplification so as to control cost and improve quality of care (Blumenthal et al., 2015). The dissertation study findings, however, demonstrated an increase in ED utilization post ACA implementation, implying that ACA implementation did not decrease ED overcrowding that has been associated with increased mortality, which is attributed to poor quality. While this study did not measure quality of health care, continued ED overcrowding has

been associated with increased mortality, delayed care, and long wait times, which is considered poor quality of care (Carter et al., 2014; Garcia et al., 2010). The increased number of ED visits post ACA implementation indicated that the indicators of poor quality persists, which may imply that the ACA may not have improved the quality of care during this study period.

The ACA and ED Visits

The main objective of ACA was to increase the number of people covered by insurance, improve the quality of care, decrease mortality, and decrease the cost of health care (Antos, 2014; Blumenthal et al., 2015; Perez, 2013). The overutilization of EDs has been associated with an increase in the overall cost of health care in this country. Proponents of ACA expansion of insurance coverage express confidence that ACA reduction of the number of people without insurance will reduce the number of people utilizing EDs for their health care. The effects of the ACA were anticipated to significantly impact the utilization of EDs thus reducing the cost of health care in the long run.

The dissertation study findings indicated that the number of people without health insurance coverage declined, despite the rise in overall number of ED visits after ACA implementation, refuting the long-held assumptions of the ACA proponents, thus demonstrating the strength of this study. The majority of the visits that were made to the EDs were made by people covered by some form of health insurance. The rise in insurance coverage increased a potential for reducing the health services provided by the EDs that were unreimbursed. These findings refuted the long-held assumption that the uninsured were the primary cause of ED overcrowding and thus the rise in overall health care cost in an effort cover the unreimbursed health care services.

The ACA was implemented in January 1, 2014, with an expansion of insurance coverage. The total number of visits made to the EDs post ACA implementation increased between 2013 and 2015 and the number of visits by the uninsured patients declined. Cheung et al. (2012) found that people covered by insurance (Medicaid) tended to utilize EDs more than those patients with private insurance or those patients without any insurance coverage, which the dissertation findings supported. The significance of the dissertation study was highlighted by the changes in the numbers of visitors to the EDs. The total number of visits prior to ACA implementations had declined from 2012 to 2103. All the visits made to EDs by all payer types declined in 2013, however, the uninsured patients declined more significantly. The ED visits made by those people covered by Medicare, Medicaid and private insurance increased in 2015 while the uninsured continued to decline.

The dissertation study findings indicated that the implementation of ACA had a significant impact on the total number of visits made to all the four EDs. Those people with health insurance increased while those without insurance decreased. One could conclude from these results that ACA insurance expansion increased the overall ED utilization, despite reducing the number of number of visits made by the people without insurance. These findings also confirmed that the new enrollees of health insurance (Medicaid) may be having difficulty accessing other services like timely primary care services due to limited number and availability of primary care providers (Cheung et al., 2012).

Trend of Number of ED Visits

The total number of visits made to the EDs in 2012, 2013, and 2015 presented a trend. The number of ED visits made by people with Medicare in 2012 were more than those visits made in 2013 and those visits made in 2013 were lower than those visits made in 2015. Those

ED visits made by people covered by Medicaid in 2012 were higher than those visits made in 2013, and those visits made in 2013 were lower than those visits made in 2015. Those ED visits made by patients with private insurance in 2012 were higher than those visits made in 2013, and those visits made is 2013 were lower than those visits made in 2015. The ED visits made by the uninsured patients in 2012 were lower than those visits made in 2013, and those visits in 2013 were lower than those visits made in 2015. These findings indicated a significant impact of the ACA on the total number of ED visits by the uninsured in 2015.

This trend was an indicator of the significance of this study as it demonstrated that expanding health insurance coverage did not reduce the overall number of visits, rather it increased the number of visits to the EDs by those people with health insurance coverage. The dissertation study findings indicated that the ACA insurance expansion increased ED overcrowding, despite reducing the number of those patients without health insurance. Smith and Medalia (2015) found the largest decrease in the percentage uninsured patients since 2008, which was also confirmed by the findings of this study.

ACA and Insurance Coverage

The dissertation study findings indicated that there was an increase in the number of people with some form of health insurance coverage and a drop in the number of those patients without health insurance. The total number of people who had some form of insurance who visited the EDs prior to ACA implementation (2012 and 2013) were lower than those who visited the ED after ACA implementation. These findings demonstrated that the ACA insurance expansion increased the total number of people with insurance who visited the four EDs, thus confirming the study findings by Smith and Medalia (2015).

The study results also indicated the significance of this study as they showed that ACA implementation reduced the number of people without insurance who visited the ED between 2013 and 2015, which suggested that ACA was making some progress towards one of its goals of reducing the uninsured by increasing the insured (Clemons-Cope et al., 2013; Decker et al., 2013; Lin et al., 2015). The dissertation study findings could indicate that an increase in number of people with health insurance coverage could increase access to health care as demonstrated from an increase in the number of people who visited the four EDs in 2015.

These results were confirmed by showing the consumption of ED is not only triggered by insurance coverage but many other factors as demonstrated by the Anderson model of health care utilization. The decision to visit the ED is triggered by predisposing factors; enabling factors, including insurance coverage; and individual specific health care needs (Anderson, 1993; Graves, 2009). The ACA health insurance expansion may have enabled the ED utilization but was not the sole cause of overcrowding.

Conclusion

The dissertation study findings demonstrated that the issue of ED overcrowding is complex, multifaceted, and sophisticated. The decision to seek ED services is not only influence by the insurance status but many other factors as illustrated by the Anderson model of health care utilization. The use of ED for non-emergency care leads to crowding, long wait times, and added stress to personnel working in these EDs, taking away their attention from those patients needing true emergency care (Tsai et al., 2010). The study findings indicated that the ACA insurance expansion increased the number of visits made to the EDs. Many assumptions have been made, which suggested that lack of insurance was the main cause of ED overcrowding, but an analysis

of the number of visits made to the ED prior to ACA and post ACA implementations led to the following conclusions.

First, the overcrowding of the EDs is not caused by lack of insurance. The implementation of ACA led to the decrease in the number of visits made by the uninsured to the four EDs without reducing the overall number of visits made to the EDs. These findings indicated that the uninsured are not the majority of the people who visit the EDs.

Second, the payer type that contributed the aggregate majority visits to EDs was Medicaid. Medicaid contributed the most number of visits in 2012, 2013, and 2015. The private insurance and Medicare patients contributed to the second and third most number of visits, respectively, and the uninsured patients contributed the least number of visits to the EDs over the study period to all four EDs.

Third, the implementation of ACA had a significant impact on the number of visits to the four EDs. The ACA health insurance expansion increased the total number of visits to the EDs by approximately 4%. These results demonstrated that the reduction of the uninsured patients did not reduce the overall number of visits to the EDs. These findings further indicated that the reduction of the number of people without insurance did not decongest the four EDs.

Fourth, the implementation of ACAs insurance expansion did not change the composition of the number of visits made to the EDs. Medicaid patients contributed the most number of ED visits, followed by private insurance and Medicare patients, and the uninsured patients contributed the least number of visits prior to and after the implementation of ACA. The number of visit went down from 2012 to 2013 (prior to ACA) and then up from 2013 to 2015 (post ACA).

Fifth, the total number of people covered by health insurance increased with ACA implementation. The total number of people with health insurance coverage in 2015 who visited the four EDs were 149,101, up from 134,918 in 2013. This number was an increase in the number of people with health insurance coverage who visited the four EDs by approximately 11% while the uninsured decreased by 41% from 2013 to 2015.

Lastly, the issue of ED overcrowding is complex and sophisticated, which may not be solved solely by insurance expansion. Although insurance status may be a factor for demand for ED services, it may be intertwined with other factors as illustrated by Anderson's theoretical model of health care utilization. The dissertation study findings indicated that there are other factors that may need to be considered together with health insurance status in an effort to solve the ED overutilization. Therefore, it is the conclusion that ED overcrowding may not only be caused by lack of insurance coverage.

Implications

The ACA insurance expansion had a significant impact on the total number of visits made to the EDs, the composition of the visits (case mix), the number of visits made by the uninsured patients, and the payer types of the people who visits the EDs. ACA insurance expansion alone may not be the solution to ED overcrowding and utilization. The ACA approach to health care utilization is a good beginning to solve the complex issues with the U.S. health care system, including ED utilization. This study indicated that ACA continues to increase the number of people with health insurance through expansion of insurance coverage, however, more is needed in order to reduce ED overcrowding so as to reduce associated mortalities and improve quality of care at these importance points-of-care facilities.

Implications to Health Policy Makers

The objectives of the ACA were to expand coverage, expand access to care, decrease cost of care, and improve the quality of care. The study findings indicated an increase in the number of people covered by health insurance between 2013 to 2015, implying that the ACA continues to make positive progress towards one of its key goals. The success of ACA will be judged by it cumulative effects on all its objectives. The ED overutilization has been associated with increased mortality and poor quality of care (Carter et al., 2014; Garcia et al., 2010). The ED overcrowding observed by an increase in the number of visits to the EDs by people with health insurance coverage is a call for the health policymaker to re-examine the EDs and evaluate the main causes that may be incorporated with lack of insurance so as to implement the necessary changes to promote the achievement of the objectives of the ACA.

The decrease of the uninsured is a positive trend for the ACA in its strive to achieving its goals. The issue of uninsured has been a challenge for the US for many years. It has been associated with increased ED utilization and increased cost of health care in this country (Anderson et al., 2014; Fisman, 2014, Rosenbaum, 2010). There have been several attempts to reform the U.S. health care system in an effort to expand coverage and decreased medical expenditures (Emanuel, 2014; Pande et al., 2011; Starr, 2013). The decrease of uninsured patients in the EDs is a positive step towards resolving the inadequacies of the U.S. health care system.

The majority of the visits to the EDs were made by the people covered by Medicaid throughout the study period. They were the majority prior to the implementation of ACA as well as after the implementation of ACA. The resolution of the ED overcrowding may depend on the reduction of the number of people with Medicaid. Some researchers have reported a decrease in

ED utilization with Medicaid expansion while others have indicated an increase in ED utilization (Baicker et al., 2013; Cheung et al., 2012; Fisman, 2014; Nikpay et al., 2017; Smulowitz et al., 2011; Tang et al., 2010; Taubman et al., 2014). Although the dissertation findings showed an increase in ED utilization, policymakers may have to examine the ED utilization and Medicaid patients globally to understand their relationship.

The dissertation study findings demonstrated that ACA was making progress towards its goal of reducing the uninsured. The complexity in scope and it multiple year rollout makes its assessment difficult and, therefore, calls for an assessment of the ACA over a long period of time. The fact that the ACA has been facing challenges from its opponents and critics and having been implemented 2 years prior to this study, these findings imply that reviewing the individual components in relation to ACA objectives and implementing of changes or amendments to that effect may strengthen its impact on the health care system. These findings indicated an increase in the number of people with insurance and the number of visits to the EDs, confirming that the ACA has made progress toward its objectives of expanding coverage and increasing access to health care. It may be necessary to evaluates its effects on adequacy of access to care, cost of health care, and the quality of health care Americans are receiving post the ACA implementation in order to assess its effectiveness.

Implications to Researchers

The dissertation findings indicated an increase in ED utilizations. The total number of visits to the EDs increased after ACA implementation while the total number of visits by the uninsured patients decreased. These findings also indicated that the total number of visits by Medicaid patients increased after the ACA implementation. These findings present an

opportunity for further studies to investigate the reasons why people with Medicaid tend to seek their health care in the EDs instead of other health care providers.

The ACA implementation has mandatory minimum coverage requirements of inclusion of preventative care services. This requirement of providing preventative service coverage at no cost to the insured was intended to promote prevention or well care visits and prevent unnecessary ED visits (Emanuel, 2014; Starr, 2013). The dissertation study findings indicated that the ACA implementation increased the total number of visits to the EDs, despite an increase in the total number of people covered by health care insurance. These results implied that there may be other factors that leads people to seek ED services. In an effort to understand the reasons why individual patients tend to seek care at the EDs, studies are necessary so as to devise long-term solutions to ED overcrowding.

The dissertation study findings also indicated that the uninsured are not the main cause of ED overcrowding. Therefore, it is important that further studies are conducted to understand the complex issue of ED utilizations. Examining the composition of the number of visits to the EDs in this study, it is clear that the majority of the ED visits were made by those people with Medicaid, followed by those patients with private health insurance and Medicare while the uninsured patients recorded the least number of visits. It is vital that further studies be conducted to explore the reasons why people choose the EDs for their health care needs.

The dissertation study results also demonstrated that there was an increase in the number of visits to EDs with an increase in the number of people covered by health care insurance, which calls for further studies in other areas of health care practice to assess whether the same effects are also experienced post ACA implementation. It is important that further studies are

conducted in other areas of health care practice, such as primary care practices and urgent care centers. The findings could be used to evaluate the overall effects of ACA insurance expansion.

Implications for Practice

The dissertation study findings demonstrated that ACA increased the number of visits to EDs with the majority of the visits made by those people with Medicaid while the uninsured patients made the least number of visits. The study results also demonstrated that the ACA implementation increased the total number of people covered by health insurance. These findings indicated that practitioners could anticipate an increased in the number of visits with an increase in the total number of people covered by health insurance.

An increase in the number of people covered by Medicaid implies that there will be more people visiting the EDs. It is important for the health care providers and administrators to plan and budget for the anticipated changes in the composition of the people visiting their various health care facilities. These changes by the health care providers at their individual practice settings are necessary to improve the quality of care and access to health care so as to minimize the increased rates of mortality and the poor quality of care.

Implications for Education

The dissertation study findings indicated that ACA had an impact on the total number of visits made to the EDs, the payer type that contributed the majority visits to the EDs, the number ED visits made by the people without insurance, and the total number of people with health insurance. These outcomes will be significant to educators in that whenever reviewing and assessing the success of any health care reform, it is important to examine the impact in relation to its objectives.

These findings also implied that the issue of ED utilization is complex that requires complex studies, and any solutions must address it globally, examining all the factors that might affect its utilization. The ACA complexity and its multi-year rollout calls for analysis of its success that is based on cumulative effects on adequacy of access to care, the cost of health care, number of people covered by insurance, and its quality of health care over a longer time period. Although significant, the study findings may not be the same in the long run.

Recommendations

The purpose of this dissertation was to explore whether the ACA insurance expansion correlated with number visits made to the EDs and the role of the uninsured in the ED overcrowding. In this study, the ACA insurance expansion was explored for a possible decrease in the total number visits made to the EDs. The study findings indicated that there was a correlation between ACA and ED visits. The ACA health insurance expansion did not decrease the number of visits to the EDs, and the uninsured patients were one of the factors that contributed, although not the major one, to ED overutilization.

The issue of ED overcrowding is a complex one that needs further evaluation to determine the factors that leads people to seek care at the EDs. Some researchers have indicated that the age of the population, increased need of interventions requiring state-of-the-art hospital care, complex medical conditions, and complications from complex medical and surgical interventions are some of the factors that contribute to ED overutilization (Fisman, 2014; Taubman et al., 2014; Weber et al., 2008). Therefore, it is recommended that further studies are needed to explore further the issue of ED overcrowding and its causes.

The ACA was implemented in 2014, and the dissertation study only involved 2015 as the year of study post ACA implementation. The one year (2015) provided a narrow and limited

scope, which made it difficult to examine the effects of ACA and establish a trend. Therefore, it is recommended that further studies are needed to expand the timeframe including more years prior and post ACA implementation so as to establish the trend and evaluate the impact of insurance expansion on the number of ED visits over a longer period of time.

In an effort to really understand why people choose to visit the EDs for their health care, it may be necessary to conduct a qualitative study that involves primarily the ED visitors, which may involve questioning the ED visitors so as to understand the reasons for selecting EDs for their health care needs, their view of ED overcrowding, and the role their payer type played in their decisions or choices. Therefore, it is recommended that further studies are needed that will involve ED visitors (patients) to understand the factors that contributed to their decision to seek care at the EDs.

Limitations and Delimitations

The complexity of the ACA in scope and length, coupled with its multiple phase rollout, makes it difficult to evaluate its successes, thus necessitating studies at the point of services. Many proponents of health care reform expressed confidence that expansion of insurance coverage under the ACA had a potential to reduce ED overutilization (Richardson & Mountain, 2009). The ACA implementation presented an opportunity for understanding the true causes of ED overcrowding; however, there were some barriers and issues that were challenging throughout this dissertation study.

This dissertation study involved the reviewing of existing data. The research sites, H1, H2, H3, and H4, had both changed their electronic medical record systems in mid-2013 in preparation for the ACA requirements that all health care facilities had to have an EMR system. When the request for data was made to the various ED directors, all of them were only able to

retrieve half of the 2013 and 2015 ED records. Several attempts were made to various heads of these ED departments in an effort to obtain the data. The data that were received were incomplete with several missing data. After several attempts, the corporate medical director of clinical services was contacted who finally responded after several attempts with contacts of the corporate director of revenue recycling. She quickly responded and requested a couple weeks to the retrieve the data from the old and new EMR and merge them together, then forward data to the investigator.

After retrieving the data and merging it together, corporate medical director of clinical service forwarded the Excel spreadsheet to the investigator. The secondary medical record data, which was received, had some missing values. Some visits recorded were missing payer type and other payer types were missing number of visits, raising question of data quality. The corporate revenue recycling director was contacted to provide the missing data and verification of the quality of data. The revenue recycling director requested more time to retrieve the data, which she completed in a couple days and forwarded the data to the investigator. The data were then reviewed and verified that there were no missing values or missing payer types.

Another issue of concern was the methods of collecting the data. Although the quality of secondary data that was utilized in this study was verified and confirmed by the source, the methodology of collecting the data was difficulty to authenticate. The data indicated the number of visits made to EDs and the respective payer types. The data received did not provide any of those visits that were truncated to other facilities, such as other hospitals and convenient or urgent care centers.

The data that was initially received had some missing information. The missing data were, however, corrected by requesting the revenue recycling director to verify and correct the

missing data and verify the payer types. These issues were readily resolved by the director promptly, providing verified and complete data for this dissertation study. It was, however, difficult to ascertain whether the corrections were true and accurate.

Although all the missing values were corrected, it was difficult to ascertain whether the missing values were imputed with values. The secondary data utilized for this study was verified, but it was difficult to understand the methods employed in collecting it and as to whether there were any data cleaning or recoding done after the fact, and the revenue recycling director did not personally collect the data.

Another barrier to this study was the fact that the ACA was only implemented in January 1, 2014, just one year prior to the study period. The assessment of the effect of the ACA on the EDs may require a study over a longer period. The number of visits made to the EDs may not have reflected the actual number of those patients newly enrolled under the ACA insurance expansion program. This time constraint hampered this study by limiting the data that were analyzed post ACA implementation to those visits made in 2015.

The effects of retail clinics and urgent care center on the number of visits made to the EDs was another barrier to this study. Urgent care centers and retail clinics are often open after hours that may have affected the number of visits made to the EDs. Prior to the emergence of urgent care centers and retail clinics, all patients who needed health care services after hours had to visit the EDs, which is not the same today. The existence of urgent care center and retail clinics may have affected the results of the analysis of the relationship between the ACA insurance coverage expansion and the number of visits made to the EDs.

The accuracy and recording methods of the secondary data, although verified, may have affected the findings of this study. The analysis of secondary data is often challenged by the

issue of original recording and accuracy of the data being utilized. The issue of accuracy and recording of data (quality of data) can only be assured if data were collected by the researcher or by observing the methods of recording the data so as to authenticate it, which was not possible in this study as the data were already collected. The issue of recording, accuracy, and originality was difficult to ascertain; however, it was verified by the revenue recycling director, who was the source of the data.

Summary

The ACA insurance expansion implementation increased the total number of visits made to the EDs, changed the composition of the visits by reducing the number of visits made by the uninsured patients, and increased the total number of people insured by health insurance who visited the EDs. The study findings indicated that ED utilization is complex, and in order to solve the issue of ED overcrowding, further studies are needed to understand the factors that influence peoples' choices to visit the EDs for their health care needs.

The study findings also indicated that there are several implications to health policy makers, researchers, health care practitioners, and educators. The findings indicated that further studies about the ED utilization are needed in order to establish long-term solutions to ED overutilization. This study had several limitations, some of which were readily solved while others were difficult to ascertain. The study findings indicated that ACA did not decreased the number of visits to the EDs, and there was a significant correlation between ACA and ED utilization.

References

American Academy of Emergency Medicine (2014). AAEM history. Retrieved from http://www.aaem.org/about-aaem/aaem-history.

Anderson, R. M. (1995). Revisiting the behavioral model of access to medical care: Does it matter? *Journal of Health Care and Social Behavior*, *36*, 1-10.

Anderson, M., Dobkin, C., & Gross, T. (2014). The effects of health insurance on emergency department visits: Evidence from an age-based eligibility threshold. *The Review of Economics and Statistics, 96*(1), 189-195.

Antos, J. R. (2014). Health care reform after ACA. *New England Journal of Medicine, 370*(24), 2259-2261.

Asplin, B. R, Magid, D. J., Rhodes, K. V., Solberg, L. I., Lurie, N., & Camargo, C. A. (2003). A conceptual model of emergency department crowding. *Annals of Emergency Medicine, 42*(2), 173-180. Retrieved from http://ac.els-cdn.com/S019606440300444X/1-s2.0-S019606440300444X-main.pdf?_tid=33b38a12-86b1-11e3-ac65-00000aab0f01&acdnat=1390758318_b6f6b6325dfd30b926cfe1063fa1fa36

Baicker, K., Taubman, S. L., Allen, H. L., Bernstein, M., Gruber, J. H., Newhouse, J. P., . . . Finkelstein, A. N. (2013). The Oregon experiment–Effects of Medicaid on clinical outcomes. *New England Journal of Medicine, 368*(18), 1713-1722.

Bernal, J. L., Cummins, S., & Gasparrini, A. (2016). Interrupted time series regression for the evaluation of public health interventions: A tutorial. *International Journal of Epidemiology, 46*(1), 348-355. Retrieved from http://ije.oxfordjournals.org/content/early/2016/06/13/ije.dyw098.full.pdf+html

Biglan, A., Ary, D., & Wagenaar, A. C. (2000). The value of interrupted time series experiments for community intervention research. *Prevention Science. 1*(1), 31-49. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4553062/

Billings, J., & Raven, M. C. (2013). Dispelling an urban legend: Frequent emergency department users have substantial burden of disease. *Health Affairs, 32*(12), 2099-2108.

Blumenthal, D., Abrams, M., & Nuzum, R. (2015). The Affordable Care Act at 5 years. *New England Journal of Medicine, 372*(25), 2451-2458.

Blumenthal, D., & Collins, S. R. (2014). Health care coverage under the Affordable Care Act – A progress report. *New England Journal of Medicine, 371*, 275–281. Retrieved from http://www.nejm.org/doi/full/10.1056/NEJMhpr1405667

Bodenheimer, T. S., & Grumbach, K., (2009). *Understanding health policy: A clinical approach,* (5th ed.). New York, NY: McGraw-Hill Lange.

Carter, E. J., Pouch, S. M., & Larson, E. L. (2014). The relationship between emergency department overcrowding and patient outcomes. *Journal of Nursing Scholarship, 46*(2), 106-115.

Chapman, C. B., & Talmadge, J. M. (1970). Historical and political background of federal health care legislation. *Law and Contemporary Problems*, *35*(2), 334-347. Retrieved form http://www.jstor.org/stable/1190890

Cheung, P. T., Wiler, J. L., Lowe, R. A., & Ginde, A. A. (2012). National study of barriers to timely primary care and emergency department utilization among Medicaid beneficiaries. *Annals of Emergency Medicine, 60*(1), 4-10.

Clemons-Cope, L., Long, S. K., Coughlin, T. A., Yemane, A., & Resnick, D. (2013).

The expansion of Medicaid coverage under ACA: Implications for health care access, use, and spending for vulnerable low-income adults. *Journal of Health Care Organizations, Provision, and Financing, 50*(2), 135-149.

Connors, E. E., & Gostin, L. O. (2010). Health care reform—A historic moment in US social policy. *Journal of American Medical Association, 303*(24), 2521-2522.

Cunningham, P. J. (2006). What accounts for differences in use of hospital emergency departments across the U.S. communities? *Health Affairs, 2*(5), w324-w336. Retrieved from http://content.halthaffairs.org/content/25/5/w324.full.html

Decker, S. L., Kostova, D., Kenney, G. M., & Long, S. K. (2013). Health status, risk factors, and medical conditions among persons enrolled in Medicaid vs uninsured low-income adults potentially eligible for Medicaid under Affordable Care Act. *Journal American Medical Association, 309*(24), 2579-2586.

Emanuel, E. (2014). *Reinventing American health care: How Affordable Care Act will improve our terribly complex, blatantly unjust, outrageously expensive, grossly inefficient, error prone system*. New York, NY: Public Affairs.

Erenler, A. K., Akbulut, S., Guzel., M., Cetinkaya, H., Karaca, A., Turkoz, B., & Baydin, A. (2014). Reasons for overcrowding in the emergency department: Experiences and suggestions of an education and research hospital. *Turkish Journal of Emergency Medicine, 14*(2), 59-63. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4909875/pdf/main.pdf

Fineberg, H. V. (2012). A successful and sustainable health system—How to get there from here. *The New England Journal of Medicine, 366*(11), 1020-1027.

Fisman, R. (2014). Straining emergency rooms by expanding health insurance. *Science Express, 343*(6168), 252-253. Retrieved from http://www.sciencemag.org/content/343/6168/252.full.pdf

Garcia, T. C., Bernstein, A. B., & Bush, M. A. (2010). *Emergency department visitors and visits: Who used the emergency department in 2007?* Atlanta, GA: Centers for Disease Control and Prevention (National Center for Health Statistics). Retrieved from http://www.cdc.gov/nchs/data/databriefs/db38.pdf

Gindi, R. M., Cohen, R. A., & Kirzinger, W. K. (2012). *Emergency room use among adults aged 18-64: Early release of estimates from the national health interview survey, January-June 2011.* Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from http://www.cdc.gov/nchs/data/nhis/earlyrelease/emergency_room_use_january-june_2011.pdf

Graves, A. (2009). A model for assessment of geographical accessibility: A case for GIS. *Online Journal of Nursing and Health Care 9*(1), 46-55. Retrieved from http://rnojournal.binghamton.edu/index.php/RNO/article/viewFile/102/84

Hadley, J., Holahan, J., Coughlin, T., & Miller, D. (2008). Covering the uninsured in 2008: Current costs, sources of payment, and incremental cost. *Health Affairs, 27*(5), 399-415.

He, J., Hou, X., Toloo, S., Patrick, J. R., & Gerald, G. F. (2011). Demand for hospital emergency departments: A conceptual understanding. *World Journal of Emergency Medicine, 2*(4), 253-261. doi:10.5847/wjem.j.1920-8642.2011.04.002

Hoffman, B. (2003). Health care reform and social movements in the United States. *American Journal of Public Health*, *93*(1), 75-85. Retrieved from http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.93.1.75

Hoot, N. R., & Aronsky, D. (2008). Systematic review of emergency department crowding: Causes, effects, and solutions. *Annals of Emergency Medicine, 52*(2), 126-136. Retrieved from http://ttuem.com/page2/page5/files/ED%20Crowding%20Review.pdf

Hunt, K. A., Weber, E. J, Showstack, J. A., Colby, D. C., & Callaham, M. L. (2006). Characteristics of frequent users of emergency departments. *Annals of Emergency Medicine, 48*(1), 1-8.

Johnson, P. J., Ghildayal, N., Ward, A. C., Westgard, B. C., Boland, L. L., & Hokanson, J. S. (2012). Disparities in potentially avoidable emergency department (ED) care: ED visits for ambulatory care sensitive conditions. *Medical Care, 50*(12), 1020-1028.

Kellermann, A. L., Hsia, R. Y., Yeh, C., & Morganti, K. G. (2013). Emergency care: Then, now, and next. *Health Affairs*, *32*(12). Retrieved from http://content.healthaffairs.org/subscriptions/online.shml.

Lin, W., Bharei, M., Zhang, J., O'Connell, E., & Clark, R. E. (2015). Frequent emergency department visits and hospitalizations among homeless people with Medicaid: Implications for Medicaid expansion. *American Journal of Public Health. 105*(5), e1-e7.

Long, S. K., Stockley, K., & Dahlem, H. (2012). Massachusetts health care reform: Uninsurance remains low, self-report health status improves as state prepares to tackle cost. *Health Affairs, 31*(2), 444-451.

Matowe, L. K., Leister, C. A., Crivera, C., & Korth-Bradley, J. M., (2003). Interrupted time series in clinical research. *The Annals of Pharmacotherapy, 37,* 1110-1116. doi: 10.1345/aph.1A109

Munro, B. H. (2005). Differences among group means: One-way analysis of variance. In B. H. Munro (Ed.), *Statistical methods for health care* (5th ed., pp. 151-171). Philadelphia, PA: Lippincott, Williams & Wilkins.

New England Health Care Institute (2010). *A matter of urgency: Reducing emergency department overuse* [Research brief]. Retrieved from http://www.nehi.net/writable/publication_files/file/nehi_ed_overuse_issue_brief_032610finaledits.pdf

Nikpay, S., Freedman, S., Levy, H., & Buchmueller, T. (2017). Effect of the Affordable Care Act Medicaid expansion on emergency department visits: Evidence from state-level emergency department databases. *Annals of Emergency Medicine, 70*(2), 215–226.

Orszag, P. R., & Emanuel, E. J. (2010). Health Care reform and cost control. *New England Journal of Medicine, 362*(7), 601-603.

Pallin, D. J., Allen, M. B., Espinola, J. A., Carmago, C. A., & Bohan, J. S. (2013). Population aging and emergency departments: Visits will not increase, length-of-stay and hospitalization will. *Health Affairs, 32*(7), 1306-1312.

Palmer, K. S. (1999). A brief history: Universal health care efforts in the US. Retrieved from http://www.pnhp.org/facts/a-brief-history-universal-health-care-efforts-in-the-us

Pande, A., H., Ross-Degnan, D., Zaslavsky, A. M., & Salomon, J. A. (2011). Effects of healthcare reforms on coverage, access, and disparity: Quasi-experimental analysis from Massachusetts. *American Journal of Preventative Medicine, 41*(1), 1-8.

Perez, K. (2013). What's next for the ACA? It depends. *Healthcare Financial Management, 67*(8), 142-143.

Portney, L. G., & Watkins, M. P. (2009). *Foundations of clinical research: Applications to practice.* (5th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Rabin, E., Kocher, K., McClelland, M., Pines, J., Hwang, U., Rathlev, N., . . . Weber, E. (2012). Solutions to emergency department 'boarding' and crowding are underused and may need to be legislated. *Health Affairs, 31*(8), 1757-1766.

Richardson, D. B., & Mountain, D. (2009). Myths versus facts in emergency department overcrowding and hospital access block. *Medical Journal of Australia*, *190*(7), 369-374.

Rosenbaum, S. (2010). A "customary and necessary" program–Medicaid and health care reform. *New England Journal of Medicine, 362*(21), 1952-1953.

Schull, M. J. (2005). Rising utilization of US emergency departments: Maybe it time to stop blaming the patients. *Annals of Emergency Medicine, 45*(1), 13-14. Retrieved from http://www.annemergmed.com/article/S0196-0644(04)01492-1/pdf

Shadish, W. R., Cook, T. D., Campbell, D. T. (2002). *Experimental and quasi–experimental designs for generalized causal inference.* Belmont, CA: Wadsworth Cengage Learning.

Starr, P. (2013). *Remedy and reaction: The peculiar American struggle over health care reform*. New Haven, CT: Yale University Press.

Smith, J. C., & Medalia, C. (2015). *Health insurance coverage in the United States: 2014* (Report No. P60-253). Washington, DC: U. S. Government Printing Office.

Smulowitz, P. B., Lipton, R., Wharam, J. F., Adelman, L., Weiner, S. G., Burke, L., . . . Landon, B. E. (2011). Emergency department utilization after the implementation of Massachusetts health reform. *Annals of Emergency Medicine, 58*(3), 225-234.

Sommers, B. D., Musco, T., Finegold, K., Gunja, M. Z., Burke, A., & McDowell, A. M. (2014). Health reform and changes in health insurance coverage in 2014. *The New England Journal of Medicine, 371*(9), 867-874.

Taubman, S. L., Allen, H. L., Wright, B. J., Baicker, K., & Finkelstein, A. N. (2014). Medicaid increases emergency-department use: Evidence from Oregon's health insurance experience. *Science, 343*(17), 263-268.

Tang, N., Stein, J., Hsia, R. Y., Maselli, J. H., & Gonzales, R. (2010). Trends and characteristics of US emergency department visits 1997-2007. *Journal of American Medical Association 304*(6), 664-670. Retrieved from http://jama.jamanetwork.com/article.aspx?articleid=186383

Tsai, J. C. H., Liang, Y. W., & Pearson, W. S. (2010). Utilization of emergency department in patients with non-urgent medical problems: Patient preference and emergency department convenience. *Journal of the Formosan Medical Association, 109*(7), 533-542.

Uscher-Pines, L., Pines, J., Kellermann, A., Gillen, E., & Mehrotra, A. (2013). Deciding to visit the emergency department for non-urgent conditions: Systematic review of the literature. *American Journal of Managed Care, 19*(1), 47-59.

Weber, E. J, Showstack, J. A., Hunt, K. A., Colby, D. C., Grimes, B., Bacchetti, P., & Callaham, M. L. (2008). Are the uninsured responsible for the increase in emergency department visits in the United States? *Annals of Emergency Medicine*, *52*(2), 108-115.

Weinick, R. M., Burns, R. M., & Mehrotra, A. (2010). Many emergency department visits could be managed at urgent care centers and retail clinics. *Health Affairs, 29*(9), 1630-1636.

Wilson, M., & Cutler, D. (2014). Emergency department profits are likely to continue as the Affordable Care Act expands coverage. *Health Affairs, 33*(5), 792-799.

Yee, T., Lechner, A. E., & Boukus, E. R. (2013). The surge in urgent care centers: Emergency department alternative or costly convenience? *Research Brief, 2013*(26), 1-6.